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AGRICULTURAL TECHNOLOGY IMPROVEMENT PROJECT (ATIP)

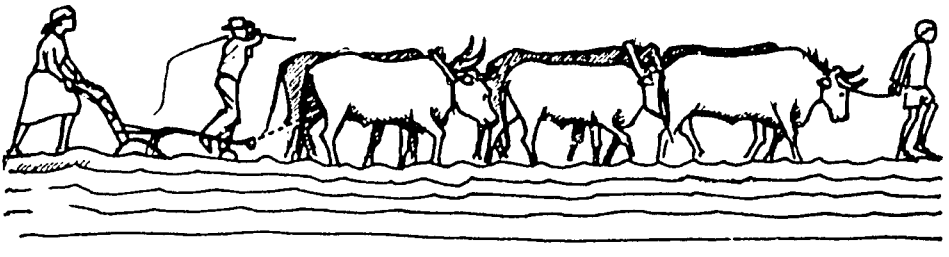
THE RESULTS OF SEROLOGICAL TESTING OF GOAT BLOOD FOR BRUCELLOSIS, CHLAMYDIOSIS, TOXOPLASMOSIS AND BLUETONGUE IN THREE VILLAGES IN THE TUTUME AGRICULTURAL DISTRICT, 1988-89

BY

T. R. THEDFORD AND F. D. WORMAN

ATIP WORKING PAPER

ATIP WP-32



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ATIP WORKING PAPERS CONSIST OF METHODOLOGICAL AND EMPIRICAL MATERIAL WHICH HAS BEEN REVIEWED INTERNALLY BY ATIP BUT DO NOT NECESSARILY REFLECT THE VIEWS OF THE DEPARTMENT OF AGRICULTURAL RESEARCH, MINISTRY OF AGRICULTURE, BOTSWANA

PREFACE

ATIP working papers are prepared and circulated to make ATIP research findings easily available to Government of Botswana personnel and researchers interested in Botswana Farming Systems.

This paper presents information on serological testing of 630 goats from the villages of Mathangwane, Marapong and Matobo in the Tutume Agricultural District. These sera were tested by the National Animal Disease Diagnostic Laboratory in Sebele for Brucellosis, Chlamydiosis, Toxoplasmosis, and Bluetongue virus antibodies. It was originally intended to expand this battery of tests, however this was prevented by technical and financial constraints.

This paper has been reviewed by the Chief Animal Production Research Officer, in Dar, Dr. L. Setshwaelo.

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Without your help this study could not have been accomplished.

THE RESULTS OF SEROLOGICAL TESTING OF GOAT BLOOD FOR BRUCELLOSIS, CHLAMYDIOSIS, TOXOPLASMOSIS AND BLUETONGUE IN THREE VILLAGES IN THE TUTUME AGRICULTURAL DISTRICT, 1988-89

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ABSTRACT

Blood samples were taken from 630 goats from three villages in the Tutume Agricultural District and tested for Brucellosis, Chlamydiosis, Toxoplasmosis and Bluetongue. All samples were negative to Brucellosis and Toxoplasmosis. Of 612 samples tested for Chlamydiosis, there was one positive and three suspects. All of these were from three herds within a single village. Positive Bluetongue reactions were reported for 47.6 percent of the 630 samples. These were fairly evenly distributed between villages and had an expected distribution among age groups.

INTRODUCTION

During December 1988 and January 1989 all of the goats owned by cooperating farmers in the villages of Mathangwane, Marapong, and Matobo were being identified by ear tag and ear tattoo. While handling these animals they were weighed, heart girth circumferences measured, age estimated, and a blood sample was collected to be tested at the Veterinary Laboratory in Sebele.

It was planned that a battery of tests would be run on this serum to see what evidence of past disease incidence could be discovered. Financial and technological constraints limited this testing to only four diseases.

OBJECTIVE

The objective of this trial was to survey the disease incidence of four diseases in twenty goat herds from three villages within the Tutume Agricultural District. Serological testing was the most appropriate technique due to distance from the laboratory and problems with transporting samples during hot weather.

JUSTIFICATION

Knowledge of the disease status of goats in rural Botswana is very limited. With limited professional veterinary staff, most of whom are assigned to work at the district level, diagnostic work-up and serological testing is rarely done in the villages unless there is some compelling reason to do so, such as a major outbreak of disease. By testing 630 animals, the complete herds of 20 farmers in three of the villages in the Tutume Agricultural District, a reasonable picture of the disease situation in this district could be obtained.

The animals were being handled as part of another trial, and the only additional effort required for this study was collecting the samples, preparing them and shipping them to the laboratory. The Veterinary personnel were interested in the results, and ATIP shared in the expense of procurement of reagents for the test procedure.

APPROACH AND DESIGN

All of the animals from the 20 farmers were handled for the identification procedures (ear tattoo and tagging) and at the same time were aged by tooth eruption, weighed and

measured around the heart girth. They were given a rapid examination for obvious disease symptoms and evidence of external parasites. Each animal was then bled into a vacuum blood collector through a 21 gauge needle from the jugular vein. All tubes were identified with a record number and the animal identification number, and a record was made of all data collected. This proved invaluable as some of the tubes became mixed at the laboratory. By using the ID number, these were easily sorted out.

The ID number consisted of a series of numbers separated by hyphens, i.e., 61 - 03 - 1257 - 1. This identified the goat as coming from village 61 (Matobo), farmer 03 (Nduse), goat tattoo 1257, and sex (1 = female, 2 = equal male, 3 = male/castrate). The four digit tattoo number came from the ear tag number (first 3 digits) and the last number in the year of birth (fourth digit). This system worked very well in assisting to keep records complete and separate.

After collection and identification, the samples were stored upside down in an ice chest until the clot formed. Each clot was removed by reversing the tube then unstoppering it and removing the clot that adhered to the rubber stopper. The tops were cleaned and dried with disposable towels and replaced on the same tube from which they were removed. All serum samples were then frozen and maintained in that state until tested. Samples were delivered to the laboratory via overnight train or automobile transport.

Each sample was subjected to the following tests: For Brucellosis, the Rapid Brucellosis Plate Test; for Chlamydia, the Complement Fixation Test; for Toxoplasmosis, the Passive Hemagglutination Test; and for Bluetongue, the Agar Gel Immunodiffusion Test. The testing procedures were spread out over a year as these tests were done when laboratory personnel had time and test materials to do them.

RESULTS

The 630 samples were dispersed over the population of goats by age as indicated by Table 1.

TABLE 1: FREQUENCY REPORT BY AGE OF SEROLOGICAL SAMPLES

AGE	NUMBER OF SAMPLES	PERCENT OF TOTAL
KIDS	219	34.8
1 YEAR	49	7.8
2 YEARS	41	6.5
3 YEARS	114	18.1
4 YEARS OR OLDER	207	32.9
TOTAL	630	100.0

Testing for Brucellosis revealed that all 630 samples tested were negative. The Toxoplasmosis test had 330 negative samples and 35 with toxic reactions, for a total of 365 tested. The rest of the samples were not tested due to a lack of test kits.

A total of 616 samples were tested for Chlamydia. Of these 612 tested negative, only one tested positive, and three tested suspicious. All four of these non-negative tests occurred in the same village and among three farmers. Abortion had not been a problem on these farms. A form of conjunctivitis had occurred about this time on these Marapong farms but

nothing was isolated from eye cultures submitted.

These data indicate that these three diseases are of no significance, at least in these villages in the Tutume Agricultural District.

Bluetongue virus serology, on the other hand, was quite different. Sera from 630 animals were tested with 300 testing positive (47.6 percent of the samples) while 330 (52.4 percent) tested negative. Among the villages there was a highly significant difference between positive and negative cases when using the Chi Square Test (Table 2).

TABLE 2: PERCENT POSITIVE AND NEGATIVE TESTS FOR BLUETONGUE, BY VILLAGE

	MATOBO		MATHANGWANE		MARAPONG	
	PERCENTAGE	N	PERCENTAGE	N	PERCENTAGE	N
POSITIVE	55.2	95	52.1	110	38.5	95
NEGATIVE	44.8	77	47.9	101	61.5	152
TOTAL[a]	27.3	172	33.5	211	39.2	247

a. Percentage of the 630 total cases tested.

When looking at age distribution between positive and negative sera a highly significant differences was seen (Table 3), again using the Chi Square Test.

TABLE 3: AGE DISTRIBUTION OF SEROLOGICAL BLUETONGUE REACTIONS

	KIDS		1 YR.		2 YRS.		3 YRS.		4 YRS.+	
	%	N	%	N	%	N	%	N	%	N
POSITIVE	15	32	33	16	54	22	63	72	76	158
NEGATIVE	85	187	67	33	46	19	37	42	24	49

This is not an unexpected distribution pattern in that positive reactions are more common as age of the animals increase.

CONCLUSIONS

From this study, it was concluded that in these villages in the Tutume Agricultural District there is no evidence to support the presence of either Brucellosis or Toxoplasmosis in goats. There was an indication of some Chlamydial infection in one village. There was no clinical evidence to support Chlamydia as a cause of abortion. It was found that villagers refer to any perinatal death as an abortion. Only two such kids were submitted for a post-mortem examination. The clinical impression from these two, described by the owners as typical of other abortions, was that most of these perinatal deaths were caused by low kid birth weights from malnourished dams. The two that were seen were terminal births but were very small and the dams were very emaciated.

Serological evidence of Bluetongue infection was very high (48 percent positive). The distribution of positive tests within the age structure was as expected, with over 75 percent

in older goats and less than 15 percent in kids less than a year old. There has been no clinical evidence of Bluetongue virus infection observed in these herds over the past 18 months. It is believed that the virus type or types present produce a subclinical disease, at least in goats.