

## BRUCELLOSIS SERO PREVALENCE IN SINGIDA REGION

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### SUMMARY:

Brucellosis serological survey in cattle was conducted in Singida Region using the Slow Serum Agglutination Test (SAT) between October 1981 and November 1985. — 1997 serum samples were collected and analysed by the SAT and revealed 168 positive reactors giving an overall infection rate of 8.51%. Infection rates ranged from 0 to 38.15% with 38.15, 32.0 and 16.7% being high herd infection rate levels on individual farms. In view of these findings extensive field surveys to cover a large number of susceptible animals are necessary to establish sero-prevalence especially among the hitherto neglected traditional stock. Also mandatory routine control measures for this scheduled zoonosis should be reinstated on all organised farms not only in this region but through out the country.

### INTRODUCTION:

Singida region is located in central Tanzania covering about 49,341 square kilometres. It lies between longitudes 33°30' and 35°30' East and latitudes 3°45' and 7°30' south (8). The region is a dominant livestock area in common with the rest of the semi-arid regions of central Tanzania which include Dodoma, Tabora and Shinyanga regions. According to the 1984 National Livestock census (under publication) the livestock population in the region stands at 946,522 cattle, 477,587 goats, 282,504 sheep, 857 pigs and 22,195 donkeys.

Brucellosis in Singida region is not well documented. Annual reports from the Regional District Departments of Livestock Development and surveys by V.I.C. Mpwapa prior to 1981 have only occasionally revealed significant numbers of positive reactors Anon 1968, 1970, 1955 and 1985. The current status of brucellosis in the country is however, described as wide-spread (IBR>Returns, 1986). Brucellosis surveys carried out in various parts of the country have revealed significant levels

of infection amongst both the traditional and exotic breeds of cattle (Anon 1968). Beinbauer and Mhoma (1974) reported infection rates of 9.14% in the lake region and 28.5% in the West Lake which were in the same range as those reported by Mahlau and Hammond (1962) (1963) and Jiwa (1974) from surveys conducted in the same Lake zone. Similar significant infection levels have been revealed in other regions, 14.2% Tabora Region (Hoffman and El-Sawah, 1969), 13.2% Iringa region, 15.2% Arusha region (Mahlau, 1967 cited by Feinhauer and Mhoma, 1974), 7.5% Masailand and 3.3% Mbulu District (Staak and Protz, 1973).

The objective of this study is to establish a baseline status of brucellosis in the unvaccinated cattle population of the Singida region.

### MATERIALS AND METHODS:

1997 serum samples were collected from cattle between October 1981 and November 1985 from the traditional livestock farmers, organised villages, institutional and parastatal farms (Table 1, 2, 3)

Table 1: Brucellosis infection rates under ranch conditions:

FARM	DISTRICT	ANIMALS TESTED	POSITIVE REACTORS	% POSITIVE	HISTORY	
					ABORTIONS	EX-MABUKI BULLS
Sagara Ranch	Singida	106	0	0	No	Yes
Sagara Ranch	"	152	58	38.15	Yes	Yes
Sagara Ranch	"	348	68	19.50	Yes	Yes
Doroto Ranch	Manyoni					Yes
Doroto Ranch	"	85	5	5.88	Yes	Yes
Doroto Ranch	"	120	5	4.16	Yes	Yes
		891	137	15.38		

Table 2: Brucellosis infection rates under dairy husbandry:

FARM	DISTRICT	ANIMALS TESTED	POSITIVE REACTORS	% POSITIVE	ABORTION	EX-MABUKI BULLS
Kititimo Mission	Singida	19	0	0	No	No
Kititimo (Mzee Kalanu)	"	8	0	0	No	Yes
Msimi Sepuka	"	33	0	0	No	Yes
Salala	Iramba	50	1	2.0	No	Yes
Kinampanda T.T.C	"	7	1	14.28	No	Yes
Msingi F.D.C.	"	11	0	0	No	Yes
Tumaini Sec. School	"	11	0	0	No	Yes
Mgandu	"	11	0	0	No	Yes
R.C. Mission	Manyoni	8	0	0	No	Yes
Isinika	"	14	0	0	No	Yes
		172	2	1.16		

Table 3: Brucellosis infection rates under traditional husbandry:

LOCATION	DISTRICT	ANIMALS TESTED	POSITIVE REACTORS	% POSITIVE	ABORTION	EX-MABUKI BULLS
Mkiwa	Singida	50	16	32.0	Yes	Yes
Mpambaa	"	93	2	20.15	No	Yes
Ndulungu	Iramba	94	2	2.13	No	No
Ulemo	"	81	2	2.47	No	No
Songambebe	"	105	1	0.95	No	No
Mkulu	"	174	1	0.57	No	No
Old Kiomboi	Iramba	243	0	0	No	No
Kintinku	"	94	5	5.32	No	No
		934	29	3.10		

Sera from farms under the traditional animal husbandry system were from the Tanzania Short Horn Zeus selected randomly. The rest of the sera were from cross-bred cattle under organised dairy units or ranch. There was no history of vaccination against brucellosis in all the farms. However, some farms reported incidences of abortions. 10—15 millilitres of blood were drawn into Mc Cartery bottles from the jugular vein by means of hypodermic needle after prior skin disinfection. The sera that separated from the blood clot upon overnight standing were decanted into Bijoux bottles. Serum samples were preserved by adding a drop of chloroform and transported to Veterinary Investigation Centre

(V.I.C.), Mpwapwa where they were screened for *Brucella abortus* reactors by the routine Slow Serum Agglutination Test (SAT). Under routine SAT analysis, serum samples are serially diluted in Kahn tubes using 0.5% phenol saline solution to give serum concentrations of 1:20; 1:40; 1:80; 1:160; 1:320 after adding 0.5mls of *Br. abortus* antigens that had been diluted 1:10 by the same diluent. The tubes were then incubated in a water bath at 37° overnight. The results were read after resting the tubes for one hour at room temperature. The highest dilution showing observable agglutination for each serial dilution was taken as the titer of the serum and the criteria for diagnosis. The results were interpreted as here under:-

### INTERPRETATION OF SAT RESULTS:

- Negative:** Without or with agglutination up to 1:20 dilution (+, ++).
- Doubtful:** With agglutination from 1:20 (+++, +++) to 1:40 (+, ++).
- Positive:** With agglutination from 1:40 (++, +++, +++) dilution and above.

### RESULTS:

The results of the 1997 cattle tested for brucellosis given in Table 1, 2 and 3. High infection rates were revealed at Sagara Ranch (19.5% and Mapunda's Farm 38.15%), Mkiwa (32%) and Kinampanda TTC (16.7%). The former two had complained of abortions among their breeding herds. The results therefore suggest that the abortions were highly

likely due to brucellosis. Abortion was not recorded at Kinampanda TTC though the infection rate obtained was high. The high infection rate could however be attributed to the limited number of animals screened. Although no statistical analysis of the data has been attempted, comparative districtwise analysis of the results given in Table 1, 2 and 3 revealed that Singida district topped the list with 17.8% infection rate followed by Manyoni 3.99% and Iramba 1.02% rates of infection (Table 4). This was possibly attributed to the high infection rates obtainable under ranches using brucellosis suspected Mabuki bulls (Table 5).

Moreover farms using Mabuki bulls introduced in the region in the financial year 1980/81 and 1981/82 under the breed improvement programme also showed generally high infection rates (15.68%) while those which had not received the bulls showed low infection rates (Table 5).

**Table 4: Infection rate in relation to location:**

DISTRICT	NUMBER OF ANIMALS TESTED	POSITIVES	
		NUMBER	%
Singida	809	44	17.80
Manyoni	401	16	3.99
IRAMBA	787	8	1.02

**Table 5: Infection rate in relation to origin of breeding bulls:**

BULLS	NUMBER OF ANIMALS TESTED	POSITIVES	
		NUMBER	%
Mabuki	1001	157	15.68
Others	996	11	1.10

### DISCUSSION:

It is apparent from the present limited survey that brucellosis occurs in Singida region and could possibly be widespread. The results reveal an average infection rate of 8.4% among all the cattle screened. Mpwapwa V.I.C. (1984, 1985) on their annual brucellosis surveys in the central zone reported similar results on individual farms for Dodoma region. Likewise Mahlau and Hammond (1962), 1963) in their survey of Tanzania Short Horn Zebus in the Lake Zone using the Milk Ring Test found an average infection rate of 13.5% which was later

closely (10.78%) reproduced by Jiwa (1974) in his survey on the aspects of bovine brucellosis from the same area.

The present finding also reveal comparatively high infection rates among ranch animals (15.38%) and the traditional herd (3.10%) thus conforming to the findings of Jiwa (1974) and the observation of Central Veterinary Laboratory, Temeke (1973).

The latter reported samples from NARCO Ranches (Kongwa/Mombo) to have shown high percentages of reactors amongst the 1559 samples received from various parts of the country out of

which 255 (16.35%) were positive. The results, however differed with those of Jiwa (1974) for the dairy herd where infection rate was comparatively smaller in Singida Region Survey. The very high infection rate among ranch animals in comparison to dairy farms in the country may be due to the lack of brucellosis control measures on the ranches while dairy farms practised stringent control measures.

Currently, the infection rates were very high on certain individual farms and ranches especially Sagara ranch (38.15%) and Mapunda's traditional herd (32%) with history of recent storms of abortion. These high infection rates may be attributable to the use of Mabuki Livestock Multiplication Unit bulls which are suspected of harbouring the infection. Mabuki bulls had previously been incriminated for introducing the disease at Sao Hill, Iringa (Kitaly, 1985). In view of this evidence there is a need for the Mabuki L.M.U. Management to ensure and certify that breeding bulls and incalf-heifers they offer for sale are brucellosis free based on three consecutive results carried out by an independent laboratory. Otherwise brucellosis may continue to assume serious proportions in the country.

The information provided in this paper is meant to reflect the present situation of brucellosis in the region. The notable involvement of our traditional herd (3.10% infection rate) considered for a long time to be relatively free due to their natural resistance (Dafaala and Khan, 1958) may indicate widespread distribution of brucellosis in the region. The finding of the current limited survey call for more exhaustive survey in order to clarify the extent of brucellosis prevalence in Singida region. The public must be enlightened on the public health aspects of this zoonosis. Furthermore mandatory vouting surveillance of organised cattle units should be instituted slighter of all reactors enforced Similarly upgrading programmes in the region and elsewhere in the country should be preped by test and slaughter policy of resident stock prior to the introduction of improved brucellosis free animals.

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#### REFERENCES:

- Anon (1983) Central Veterinary Laboratory, Temeke annual reports - Brucellosis Serological Survey p9 — 10.
- Anon (1983) Ministry of Agriculture and Cooperatives Veterinary Division annual report p7.
- Anon (1970, 1984, 1985) Veterinary Investigation Centre Mpwapwa annual report.
- Anon (1973) Veterinary Investigation Centre Mwanza annual report p13 — 19.
- Anon (1968, 1975) Singida District Livestock Development Office annual report.
- Beinhauer, W and Mhoma J.R.I. (1974) Brucellosis and other bacterial abortions. Annual Liv. Res. Off, Conf. p22 — 29.
- Dafaala, E and Hand Khan, A.Q. (1958) Bull. Ep 12. Epiz. Dis. Afr. 1 243.
- District Development Status, June 1984 PMO's Office Department of Regional Administration and Planning.
- Hummel, P.H. (1972) Brucellosis problem. Annual Res. Conf. Central Veterinary Laboratory, Temeke p21-31.
- IBR - Returns. Summary of Distribution of Livestock Diseases March - June 1986. Directorate of veterinary services - Ministry of Agriculture and Livestock Development, Dar es Salaam.
- Jiwa S.F.H. (1974) Aspects of bovine brucellosis in the Lake Zone of Tanzania. Annual Liv. Res. Off. Conf. p30 — 37.
- Kitaly J.I. (1985, personal communication).
- Mahlau, E.A. and Hammond I.A. (1962, 1963) Annual Report Veterinary Investigation Centre, Mwanza.