

A SURVEY OF RISK FACTORS WITH REGARD TO BOVINE TUBERCULOSIS AND BRUCELLOSIS IN MNISI, MPUMALANGA PROVINCE, SOUTH AFRICA

INTRODUCTION

Cow's milk forms an essential component of household diets and is an important source of animal protein to poor communities (especially for the young and old). Milk is largely consumed unpasteurised and poses a threat to human health from zoonotic diseases such as bovine tuberculosis (BTB) and brucellosis (Bryan 1983). The recent detection of both infections in the cattle population in the Mnisi area (Matekwe 2012, Musoke unpublished information) prompted an investigation of the risk factors associated with the zoonotic transmission of the causative agents, *Mycobacterium bovis* and *Brucella abortus*.

OBJECTIVE

To conduct structured interviews with randomly selected cattle owners and non-cattle owners in Mnisi, to investigate the risk factors associated with the transmission of BTB and brucellosis from cattle to humans.

METHODOLOGY

Study area: The study was conducted in Mnisi Local Municipality in Mpumalanga Province, South Africa. Three areas were selected for conducting interviews: (1) Hluvukani town and surroundings which is at the center of Mnisi Local Municipality; (2) Communal area along a main road to Hluvukani distant from the game reserves (3) Communal area bordering the Manyeleti and Sabi Sand Game Reserves (**Figure 1**).

Research instrument: A structured, paper-based questionnaire survey was used in the collection of data from 300 households by conducting face-to-face interviews.

Sampling: 150 cattle owners and 150 non-cattle owners were randomly selected.

Every tenth household in the selected areas was interviewed until the target number was reached.

Analysis: SAS version 9.3 running under windows XP 9.3 (Service Pack 3) was used to analyse the survey data.

RESULTS

Household demographic and socio-economic data

The following data were collected from 299 respondents (household heads):

Average number of people per household: 11.3

Respondents' age: 67.2% > 50 years of age.

Level of education: 71% had either no or only primary school education.

Children under the age of 18 years: 25.5% of households reported to support 1 or 2 children, 40.5% support 3 or 4 children, with up to 12 children supported by the remaining 35%.

Occupation: 68% either unemployed or pensioners, 35% industrial employees or self-employed, 4.7% professional occupation, 2.7% full-time farmers.

Dispensable income: 90% of households live on less than R 5000 per month

Risk factors for bovine tuberculosis

Cattle breeds: The distribution of cattle breeds owned by livestock keepers is depicted in **Figure 2**.

Herd size: The average herd size was 17 animals, comprising 6 - 12 cows, 2 - 3 heifers, 1 - 3 calves and 1 bull. Cattle are farmed extensively and utilise communal grazing.

Livestock/wildlife contact: 63% of farmers reported regular contact between their livestock and wildlife, the majority of whom were located in study area 3 (**Figure 3**). Most contact occurred with buffaloes (63.8%) and warthog (20%).

Movement of cattle: 7% of farmers reported introduction of cattle into Mnisi from other districts in the same province during the past 12 months.

Risk factors for zoonotic tuberculosis

Consumption of unpasteurised milk was reported by all cattle owning households.

Distribution of milk: 36% of farmers sold milk to the community, of which 72% sold fresh, untreated milk.

Milk consumption in households owning cattle:

- 46% raw milk
- 36% boiled milk
- 18% fermented (soured) milk.
- Within households, both consumption of raw milk as well as all forms of milk (raw, boiled, soured) was highest among children < 18 years of age. In older age groups milk consumption was inversely correlated with age.
- When needed, milk was mostly bought in the supermarket, followed by kiosks and stalls along the road, whereby the frequencies of buying at a particular source varied between study areas (**Figure 4**).

Zoonotic awareness:

- Among households owning cattle: 56.7% of respondents were unaware of the zoonotic nature of bovine tuberculosis and brucellosis
- Households without cattle: 82.7% of respondents were unaware.
- In both groups State Veterinary Extension Services were mentioned as the most important source of disease related information.

DISCUSSION AND CONCLUSION

Generally recognised risk factors for BTB and brucellosis including herd size, movement of cattle, production system and cattle breed appear to play a minor role in Mnisi which may explain the low prevalence of the diseases (Matekwe, 2012, Musoke, unpublished data). Reported livestock/wildlife contact, especially with regard to African buffaloes was highest in study area 3 and emphasises the high risk of wildlife/livestock transmission of BTB.

Widespread consumption of unpasteurised milk and the limited awareness of zoonotic tuberculosis as a public health threat represent major risk factors for the transmission of *M. bovis*, should the prevalence in the bovine population increase.

References
Bryan F L 1983 Epidemiology of milk-borne diseases. *Journal of Food Protection* 46: 637-649
Matekwe, N. 2012. Seroprevalence of *Brucella abortus* in cattle at communal diptanks in the Mnisi area, Mpumalanga, South Africa. MSc thesis, University of Pretoria.



Figure 1: Map depicting the study areas 1 - 3 within the larger Mnisi community area.

Distribution of cattle breeds (%)

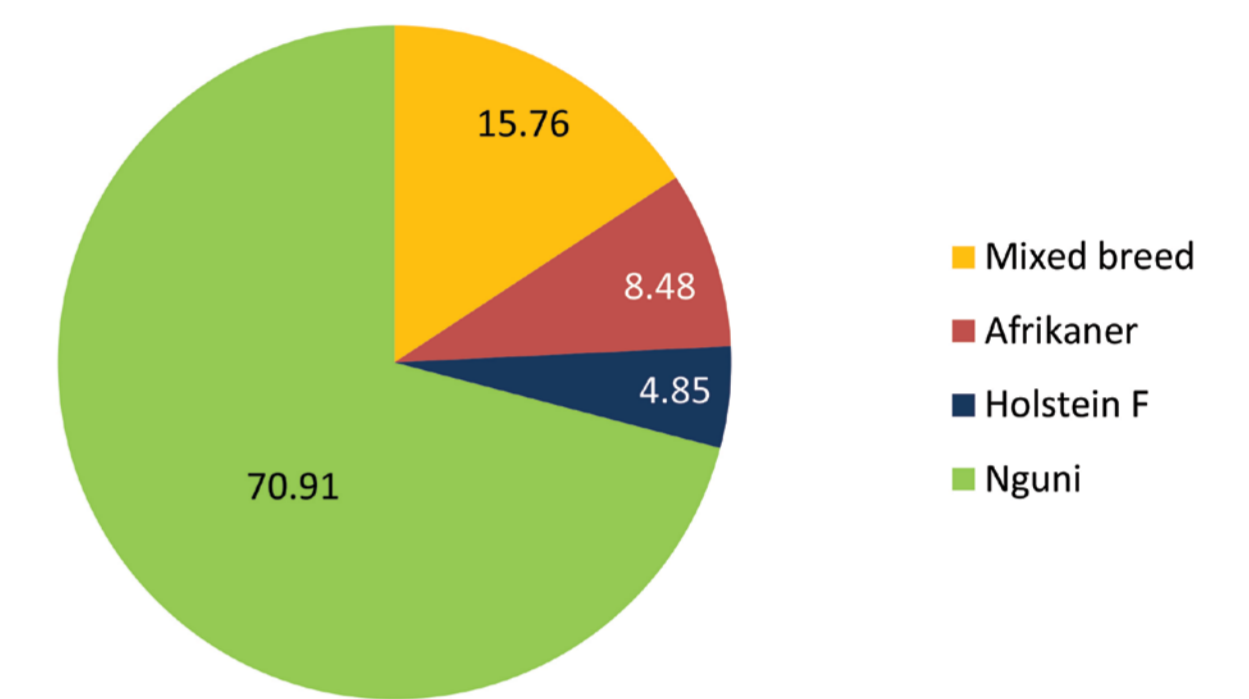


Figure 2: Cattle breeds owned by livestock keepers in Mnisi

Livestock/wildlife contact

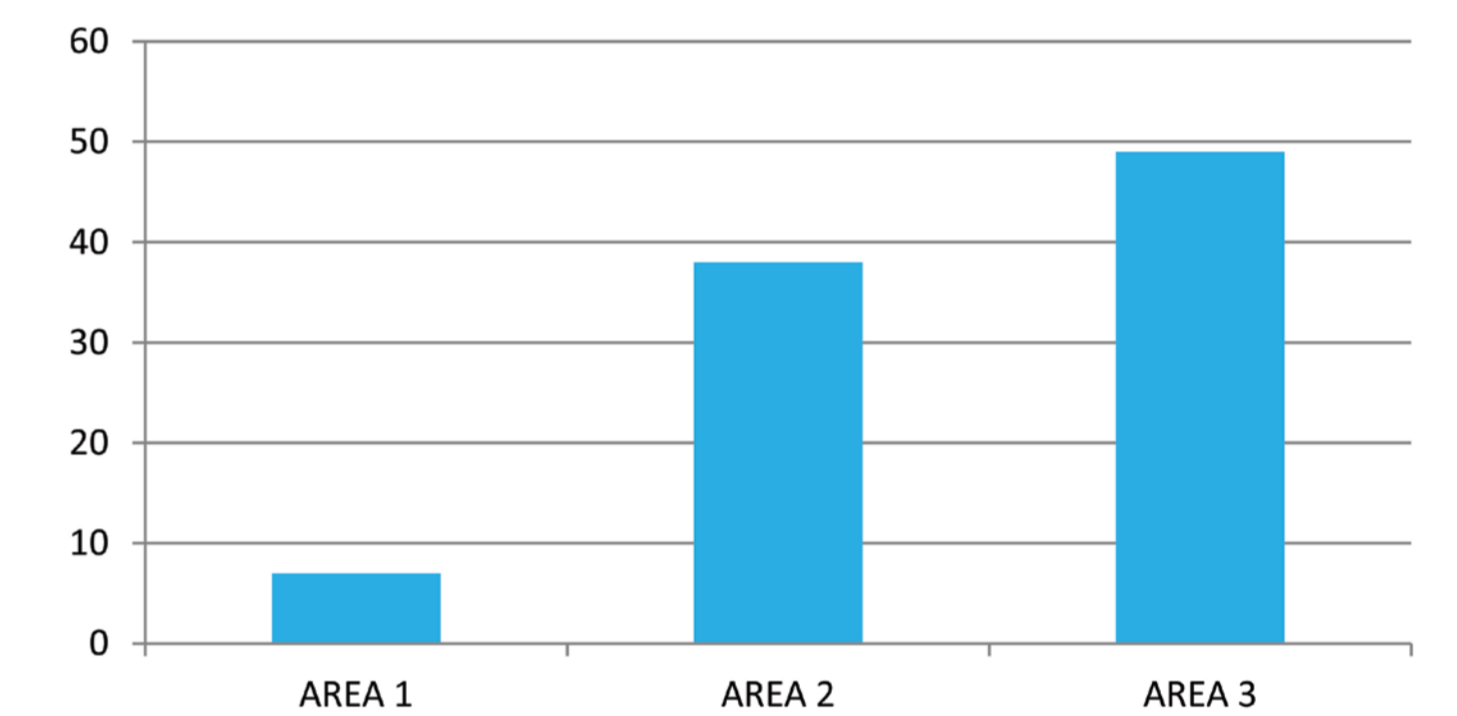


Figure 3: Number of respondents reporting regular contact between wildlife and livestock. Area 1: Hluvukani Town; Area 2: communal area along a main road; Area 3: communal area bordering game reserves



No. of households buying milk at different outlets

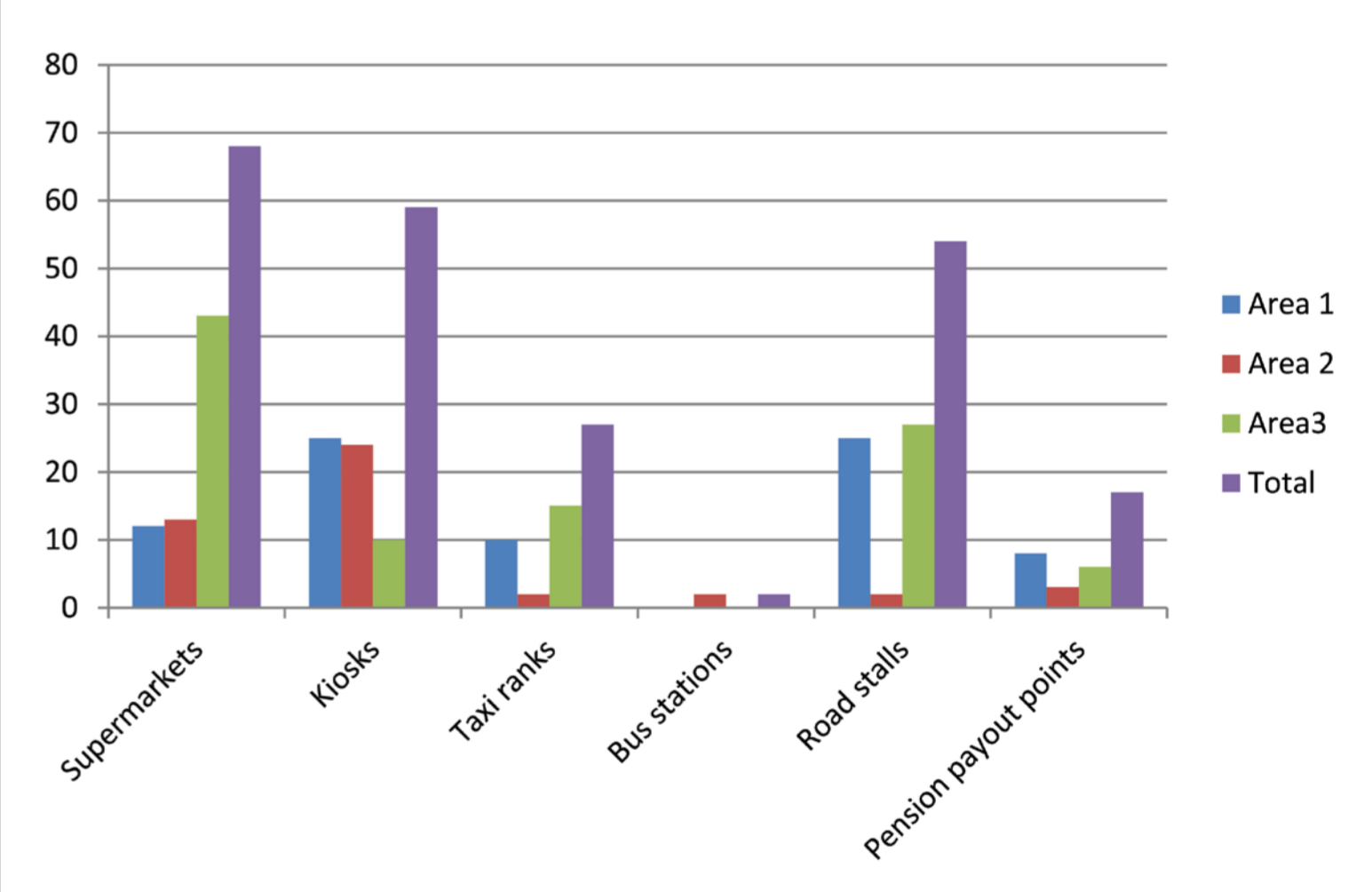


Figure 4: Outlets where respondents reported to buy milk (fresh, boiled or soured) for consumption.