Veterinary needs of dogs in two resource-limited communities in the Gauteng and North West provinces of South Africa

W N Minnaar and R C Krecek

ABSTRACT
Information on the socioeconomic aspects and the health status of dogs in 2 resource-limited communities in the North West and Gauteng provinces of South Africa was gathered using semi-structured interviews and a standardised questionnaire. The dogs were examined clinically to determine their health status, and their body condition and age were scored. Most of the dogs (93% in Jericho and 90% in Zuurbekom) were infected with hookworm, which poses a threat to animal and human health in the 2 study areas. Many dogs were also being given a protein-deficient diet, which together with hookworm parasites would impact considerably on the dog's health. Dogs were mainly kept for security reasons. The need indicated to be most important by the residents of the 2 communities was a lack of available and affordable veterinary services.

Key words: dogs, Gauteng, North West Province, resource-limited communities, veterinary needs appraisal.


INTRODUCTION
Poverty results in a lack of political power to make choices, access to education and information by the communities and limited or less than optimal use of resources. Understanding the needs of these communities is therefore essential and can be achieved through a variety of assessment methods. One such method is the Veterinary Needs Appraisal (VNA). This provides a rapid means of assessing the socioeconomic needs and health status of animals within human communities.

In a recent survey of animal welfare needs in Soweto, just southwest of Johannesburg in the province of Gauteng, treatment of sick animals was seen as a priority by 29.6% of owners interviewed. However, less than 1% actually made use of private veterinarians. In 2 other studies the animal owners in resource-limited communities indicated an awareness of the importance of animal health and the need for accessible and affordable veterinary services.

The objectives of the current study were to assess the veterinary needs, health status, diet, care and helminth and other parasite occurrence of dogs in 2 areas. The occurrence of helminths and other parasites in these studies has been reported earlier. The methodology followed that of the Mashishing (Mpumalanga) VNA undertaken in May 1996. The 2 study areas were Jericho and the surrounding villages west of Pretoria in North West Province, and Zuurbekom and surrounding townships southwest of Johannesburg in Gauteng (Fig. 1). The Jericho VNA was conducted from 11–14 March 1997 and the Zuurbekom VNA from 19–22 January 1998.

Jericho is a rural Setswana farming community with a formal local governing body led by the village headman, who in turn answers to the chief headman. The livestock in Jericho are kept and raised extensively in a communal grazing system.

Zuurbekom is a peri-urban community that falls under the Gauteng Provincial Farmer Settlement Programme (July, 1997). The government bought commercial farms (29 000 ha) in the area, divided them into smaller (7–9 ha) stands and resold them to 800 prospective small-scale farmers. The residents belong to various ethnic groups and there is no formal presiding authority in place. The resettlement process is still under way, with many farmers still settling in.

The socioeconomic information was gathered via semi-structured interviews with each dog owner using a standardised questionnaire. Dog owners indicated to the community leaders whether they wished to take part in this study, and whether they or their representative was available on the day the VNA team visited the area. Interviewees were guided through the questions with the assistance of an interpreter when necessary. This helped to gain information with regard to the environment, the owner’s economic situation, and practices that potentially affect the dog’s health and level of parasitism. Some additional information was gathered by careful observation of the environment, for example the size of the area where the dogs were kept, the type of food available to the dogs, shelter, bedding and restraint.

Before both VNAs, meetings were arranged with the community leaders to inform the residents about the purpose of the studies and to encourage their co-operation. The dog owners were visited in the mornings, the dogs examined and the animals’ home environment assessed. Daily report-back sessions were held each afternoon of the same day with the community. All information was consolidated in the final meeting on the last day.

The appraisal team included 2 veterinarians, a veterinary technologist and an animal health officer-in-training who also served as an interpreter when required. The owners were interviewed during the clinical examination of their dogs, after which biological samples were collected from the dogs. Samples were not taken from all the dogs examined, as some dogs were too sick, heavily pregnant, small, nervous or aggressive to handle.

The breeds of dogs were recorded as...
well as their ages, based on the size of the animal, body proportion, tooth development and feedback from the owner when available. The body condition score (BCS) was also recorded. In this study body condition was scored on a scale of 1–5, where 1 represents severe emaciation, and 5 represents severe obesity, with numbers 2-4 indicating intermediate stages of body condition. The BCS method developed by Laflamme was simplified for the current study. Laflamme used a scale of 1–10, and the current study a scale of 1–5.

RESULTS
The villages visited in the 2 areas, the number of owners interviewed, the numbers of dogs examined and samples obtained are summarised in Table 1. 'Dogs sampled' refers to dogs from which at least 1 sample of a possible set of 3 (blood, faeces and adhesive tape swabs) was collected.

In these resource-limited communities, residents kept an average of 3 dogs. Seventy-one percent of the dog-owners in Jericho and 53 % in Zuurbekom had 3 dogs or fewer, and 94 % and 68 % residents owned 5 dogs or fewer, respectively. One person in Jericho owned 17 dogs.

Table 2 lists the diets of dogs that were normally provided by their owners. This may have been supplemented by scavenging in many cases, as 66–74 % of all dogs roamed the area freely. Various combinations of food were given on the basis of 'when available', and occasional supplementation regarded as leftovers included bones, fat and meat broth. Some owners also added milk or food scraps to the basic diet of porridge. Meat was given to the dogs in various forms (e.g. mince, butcher’s sawdust and slaughter scraps).

Table 3 gives the BCS of the dogs in the 2 communities. Dogs of several breeds and crossbreeds were identified in both areas. In Jericho 88 % and in Zuurbekom 100 % of owners kept dogs for security reasons, while 6 % of owners in Jericho also kept their dogs as pets. One owner in Jericho had 8 greyhounds that he used for hunting small game, and an owner in Vereeniging had 2 border collies, which he found particularly useful for herding cattle and sheep. The dogs were therefore expected to work, in addition to being kept for the enjoyment of the owners and their families.

Dogs from all age groups were included in the study. In many cases the owners did not know the age of their dogs, and in some cases the true owners were not there to provide the information. All the dogs were therefore classified into the 4 age groups listed in Table 4.

Health problems of dogs in Jericho observed by the appraisal team by examination or testing were hookworms (93 % of dogs examined), cestode infection, Transmissible venereal tumour (TVT), benign skin neoplasm, parvovirus, distemper, ectoparasites (Cordylobia anthropophaga, ticks, fleas, lice) and skin afflictions (trauma, tick bite necrosis, reaction to old motor-car oil).

Health problems observed by examination or testing in dogs in Zuurbekom were hookworms (also 93 % of dogs infected), keratitis, distemper, external parasites (ticks, fleas, lice, mites, bites by stable flies), superficial skin wounds and photosensitivity (collie nose), motor vehicle accidents (lower back injury and loss of digits) and a fractured mandible.

External parasites on dogs in both areas were identified as *Rhipicephalus sanguineus* ticks, and to a lesser extent *Hemaphysalis leachi*. *Cordylobia sp.* (skin bot) infestations were seen only in Jericho, probably because of the warmer subtropical climate and the higher rainfall experienced during the 1997 summer.

Standard veterinary procedures such as vaccination, deworming, castration and spaying were not normally performed on the dogs, but the owners would certainly consider these if there was a veterinarian...
Diet owners (n) | Jericho | Zuurbekom | Total  
--- | --- | --- | ---  
Maize porridge/samp with or without milk | 7 | 2 | 9  
Porridge supplemented with bones, meat shavings and/or leftovers | 6 | 7 | 13  
Porridge supplemented with commercial dog food | 12 | 4 | 16  
Commercial dog food only | 6 | 5 | 11  
Leftovers only | 2 | 1 | 3  
No information available | 1 | 0 | 1  
Total | 34 | 19 | 53  

**Table 2: Diets of dogs observed during interviews with their owners in Jericho and Zuurbekom.**

| Condition score* | 1 | 2 | 3 | 4 | 5 | Total |  
--- | --- | --- | --- | --- | --- | --- |  
Jericho | 2 | 40 | 47 | 1 | 0 | 90 |  
Zuurbekom | 6 | 31 | 57 | 2 | 0 | 96 |  
Total | 8 | 71 | 104 | 3 | 0 | 186 |  
% | 4.3 | 38.2 | 55.9 | 1.6 | 0 | 100 |  

* Adapted from Laflamme.

in the vicinity, and if they could afford it. Of all the dogs sampled, 88 % had not been given any form of veterinary attention. Some dogs had been vaccinated during the government’s rabies vaccination campaigns. Some dogs had docked tails; this procedure had been performed by their owners. During the personal interviews, the owners expressed a general desire for veterinary services. An overall perception of how much money dog owners were prepared to pay for a number of standard veterinary procedures is given in Table 5.

**DISCUSSION**

Between 80–94 % of the dogs in the 2 study areas had a body condition score of 2–3. In addition, 93 % of the dogs examined in Jericho and 90 % in Zuurbekom harboured hookworms, which may not only cause disease in the dog but is a zoonotic threat (cause of cutaneous larva migrans) to the humans in the community. Most dogs are fed mainly maize meal, a diet that is deficient in protein. The combination of infection by internal parasites (e.g. Ancylostoma caninum) and a protein-deficient diet could give rise to stunted growth, suboptimal body condition, nutritional and hormonal imbalances and increased susceptibility to disease.

Although most owners provided shelter for their dogs against the elements, some did not consider bedding a necessity. Despite the majority of properties being fenced off, dogs could easily escape and roam well beyond the property boundaries. Some owners reported that their dogs never left their properties but that they occasionally took them along when they visited family and friends in the neighbourhood. Some dogs were chained, but most were let loose during the day when the owner was home, or at night to guard the property. One owner at Elandsfontein, Zuurbekom, chained his dogs in and around the cattle kraal at night to protect his stock from thieves. There was a tendency to chain larger dogs, especially where free-ranging chickens were kept, to prevent them from catching chickens or eating the eggs. Smaller dogs were generally allowed to run free. On a few occasions it was necessary to advise owners about the risk to the dog’s life and health of not vaccinating the dogs.

**Table 3: Body condition scores of dogs examined in Jericho and Zuurbekom communities.**

### Table 4: Age distribution of dogs examined during the Jericho and Zuurbekom VNAs.

| Age group | Jericho | Zuurbekom | Total |  
--- | --- | --- | --- |  
Pups (<3 months) | 10 | 38 | 48 |  
Subadults (3 months – 1 year) | 35 | 48 | 83 |  
Adults (1–8 years) | 41 | 89 | 130 |  
Old (>8 years) | 4 | 2 | 6 |  
Total | 90 | 96 | 186 |  

**Table 5: Fees for various procedures proposed by dog owners interviewed in Jericho and Zuurbekom.**

| Procedure | Fee proposed |  
--- | --- |  
Deworming | R3.50–20.00 |  
Vaccination | R5.00–50.00 |  
Sterilisation | R20.00–100.00 |  
Wound dressing and/or sutures | R2.00–50.00 |  
Bone fracture fixation | R30.00–100.00 |  

helminths in the environment and the is even more alarming if one considers the Onderstepoort, pers. comm., 1999). In these study areas where dogs roam freely there is a high level of transmission. De- worming together with faecal removal is effective. Together with effective dewormer, regular deworming of pups and young dogs, deworming of pregnant and lactating bitches and sick animals can be cost-effective.

Eighteen of the 53 dog-owners (34%) in the 2 studies removed dog faeces from the environment. This is significant because it is probably the helminth parasite control measure that can have the most impact on worm levels in the environment. In these study areas where dogs roam freely there is a high level of transmission. Deworming with faecal removal is an effective strategy that reduces worm levels significantly in other hosts such as donkeys (Matthee, Faculty of Veterinary Science, Onderstepoort, pers. comm., 1999).

Parasitism in dogs in these communities is even more alarming if one considers the accumulation of infective stages of helminths in the environment and the threat they pose to the human popula- tion. Most of the dog helminths encoun- tered in these study areas were zoonotic, and the children were at high risk, since they are barefooted and play in muddy areas where infective hookworm larvae may be available. The men often work in the cities or elsewhere and have less frequent contact with the infective envi- ronment and infected dogs.

Most dog owners adopted a policy of ‘wait and see’ when asked what their actions would be should their dogs become ill. Many said they would not do anything specific but just let the disease run its course. A ‘no intervention’ or ‘wait-and-see’ approach may not be in the animal’s best interest. Although some degree of resistance to parasites by host develop in time, many parasites persist. The lack of veterinary care is even more serious in households where there is more than 1 dog, as reinfestation and cross-infection continue to take place. Dog owners may argue that they cannot afford the cost of deworming their dogs, but that argument is not supported when owners have large numbers of dogs. Feeding an extra dog for a year costs more than deworming 2 dogs for a year. Restricting movement of dogs also becomes more difficult for owners who have many dogs.

Nearly all the dog owners interviewed considered the lack of, or difficult access to veterinary services and advice as a problem. The communities identified a need for veterinary procedures such as vaccination and sterilisation. Judging by the relative dog age distribution patterns in these 2 communities, slightly less than half the dog population consisted of pups and sub-adults, indicating a low average life span, and thus a low survival rate. Dogs roamed freely, and even in house- holds where the dogs were chained, the property boundaries were not dog-proof, inviting visitors and resulting in indiscriminate breeding.

Only in the Doornkop section of Zuurbekom was veterinary assistance within easy walking distance. Residents in the Vereeniging part of the Zuurbekom area were situated about 5 km from the nearest co-operative, but they still had to travel at least 10 km to the nearest veterin- ian. All the other areas visited were 10 km or more from the nearest veterin- ian or animal welfare organisation.

All the residents interviewed consid- ered that a mobile veterinary clinic to serve the area would be an excellent idea, but their enthusiasm was dampened somewhat when the question of costs was raised. One dog owner said that he would not be prepared to pay for such a service, while another was willing to pay a flat rate of R5.00, whether for deworming, sterilisation or internal fixation of frac- tured bones. Most of the other owners, however, were willing to pay a more reasonable fee for services (Table 5). Two dog owners from Zuurbekom were willing to pay for the treatment of wounds and fractures, whatever the cost might be. This latter response was in agreement with the study in Moretele 1, North West Province, where owners were prepared to pay for services.

Besides the distance to and accessibility of veterinary and paraveterinary services, the economic situation score (ESS) of households will to a great extent indicate the potential for awareness, management and quality of veterinary care in a community. Criteria used to assess this score are size of the home and number of rooms, type of building material used, presence of a ceiling, gutters, electricity supply, electrical appliances, telephone lines and type of floor cover. In this assessment the smallest, most simple structures (e.g. single-room corrugated-iron con- struction with no ceiling or floor, with roof held down by stones, and where the cooking is done on an open fire) scored 1, and the most luxurious well-furnished, plastered and painted houses with more than 3 bedrooms, flush toilets, and with all extras added scored 5. Some homes with both television and electricity, but comprising only a single-room corrugated iron structure, did not fit into any category of this scoring system. A more appropri- ate system is needed to adequately assess the economic and social level in such communities. The ESS in Jericho ranged from 1–4, and averaged 2. Although the ESS of the Zuurbekom area varied between 3 and 4, it could not be taken as a reflection of the true economic situation of the residents in the community. This is because Zuurbekom is a government resettlement area for small farmers, and resettlement is still in progress. The old farmhouses were taken over by the new owners, and therefore give the wrong impression of the economic situation of their new owners.

This study indicates that the lack of available and affordable veterinary services has a negative impact on general animal health in resource-limited communities, and that the presence of zoonoses such as helminths of dogs may put community health at risk. Written and oral information should be offered to these communities so they can under- stand the risk of these parasites. In this study, medical information was not avail- able about the occurrence of the zoonotic conditions caused by these helminth parasites in these communities. However, the availability of such information combined with similar veterinary studies is needed to provide an indication of the level of risk to these communities.

ACKNOWLEDGEMENTS

We thank Profs Colin Stewart and Cheryl McCrindle for their cooperation and facilitation, the Gauteng State Veteri- nary Services for logistic and financial assistance with the Zuurbekom appraisal, the University of Pretoria, National Re- search Foundation and Bayer Animal Health for financial support, Mr H M Boshoff for technical assistance, Mrs R Serfontein and Mrs F Lottering for typing the manuscript, and Prof. I G Horak and anonymous referees for helpful comments.

REFERENCES

Book review — Boekresensie

Tierzucht in den Tropen und Subtropen
[Animal breeding in the tropics and subtropics]

Edited by Peter Horst and Ingeborg Reh


This is a completely new edition that has been expanded to include production techniques for animals species that are less well known to students, veterinarians, extension officers in community services and agrarian specialists who would like to understand the problems of animal production in the tropics and subtropics.

Twenty-three authors from 6 different parts of the world have contributed. They have with tremendous diligence compiled information on problems of animal production mainly in Africa, but also in Southeast Asia, Malaysia, Indonesia, Australia, India, and South and Central America.

It is estimated that 55 % of sheep, 69 % of cattle, 95 % of goats, and almost all buffaloes and camels are kept in tropical and subtropical regions. There are almost insurmountable problems relating to animal breeding, nutrition and health that face practitioners and scientists when planning systematic animal improvement.

Only by listing the chapters can the amount of work covered by the authors be appreciated: Animal production world-wide; Problems of animal production in the tropics and subtropics; Nutrients and the provision of feed; Animal diseases and control measures; Breeding and production improvement; Production techniques in utility animals (cattle, buffalo, sheep, goats, equines including donkeys and mules, pigs, poultry, rabbits, guinea-pigs, bees and silk-worms). An important chapter deals with the use of wild life (antelope, rodents, kangaroos, ostriches and crocodiles). Aquaculture is of great importance in tropical and subtropical areas, and the most important fish species are listed with their production potential. The final chapter is a discussion of the improvement of natural pastures, where the human factor, problems of ownership, climatic and soil conditions are the overriding difficulties facing technology transfer.

The book represents a major contribution to the knowledge of animal production in the tropics and subtropics. The authors and especially the editors went to great lengths to pursue all possible pathways to improvement of production animals for the better nutrition of people in these regions. It is exceptionally well produced, with good clear illustrations, and is a pleasure to read. It is therefore highly recommended to students, veterinarians, and agrarian specialists who would like to gain a better insight into animal production problems in developing countries.

D R Osterhoff
Professor Emeritus
Faculty of Veterinary Science
University of Pretoria