

A questionnaire survey of perceptions and preventive measures related to animal health amongst cattle owners of rural communities in KwaZulu-Natal, South Africa

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ABSTRACT

A questionnaire survey of 315 cattle owners from the rural districts of KwaZulu-Natal was carried out. The aim of the survey was to improve our understanding of local farmers' perceptions and practices of animal disease prevention and control and to establish the extent of their relationship with veterinary services. The survey showed that many owners practice preventive measures such as deworming, tick control and vaccination. Traditional medicines were in use by over half the respondents (58.9 %). Diseases are regarded as an important management problem (56.1 %); ticks, worms and diarrhoea dominated the mentioned health problems in cattle. Veterinary services still play an important role and are a frequent source of advice to owners. The findings of the survey and their context are discussed.

Key words: disease control, livestock health, parasite control, rural communities.

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INTRODUCTION

The former homelands of South Africa are generally regarded as resource-poor areas with poor infrastructure, a high unemployment rate and with subsistence farming dominating other agricultural activities. Production indicators, such as herd mortality and calving rate are generally far below those of commercial farmers¹². Before help can be implemented in an effective manner, areas where improvement is needed must be identified. From a veterinary point of view, this involves not only estimating the prevalence of infectious diseases, but also understanding the related perceptions, culture and needs of the communities, which has been proven very important for any successful disease control¹³. With the change of the government in 1994, rural

communities have received more attention and several studies investigated the needs of livestock owners¹¹ as well as production parameters¹² and parasite control^{8,9,15} in various areas of South Africa. At the same time changes are occurring in the Provincial Veterinary Services (PVS). In the past PVS had built a large number of diptanks in the rural areas and implemented a large-scale dipping systems for the control of tick borne diseases. Owners were encouraged to dip their cattle at regular intervals. In the future cattle owners may be encouraged to take on more responsibility in the maintenance of the dipping process.

The objective of this survey was to improve the understanding of the perceptions local cattle owners have towards

- veterinary services;
- the stock health and management problems they experience;
- measures in use for the prevention of disease.

MATERIALS AND METHODS

The survey population comprised a convenience sample of cattle owners of the rural areas of KwaZulu-Natal. In total 315 livestock owners were interviewed

on a voluntary basis at diptanks in 9 surveillance zones throughout the province between March 2001 and December 2003. This questionnaire survey was conducted as part of a large-scale serological survey investigating the prevalence of brucellosis, tick borne diseases, African horse sickness, enzootic bovine leukaemia, Rift Valley fever, leprospirosis and dourine in KwaZulu-Natal. The number and proportion of questionnaires collected in each zone are given in Table 1.

The structured interview contained 28 questions focussing on the following topics:

- General demographic information concerning the interviewed person and the numbers of livestock kept.
- Knowledge and perceptions of Provincial Veterinary Services (PVS) (contact for advice, perceptions, desired extension services).
- Details of vaccinations and parasite control measures presently in use and the role of traditional medicines.
- Perceived health problems of owned animals and related management problems.

Thirty-two Animal Health Technicians (AHT) employed by the Provincial Veterinary Services, were given a day of training before the survey and were instructed to conduct the interviews personally in Zulu during the routine dipping procedure. Answers were recorded on a data capture sheet and entered into and analysed with the software program Epi Info (version 3.3.2, CDC Atlanta). The Chi square test was used to test for significant associations. Since not all respondents answered all questions or owned the relevant species, the denominator for proportions was chosen to be the number of answers and the number of relevant owners, respectively. The survey was carried out in 9 surveillance zones and although the survey was analysed using all the answers, analysis at zone level was also carried out to reflect local differences and is reported as the range in brackets after the overall result if relevant regional differences occurred. The number of

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Table 1: Number and proportion of interviews in the districts included in the 2002/03 survey in KwaZulu-Natal.

District	Dundee	Durban	Estcourt	Hluhluwe	Ixopo	Pietermaritzburg	Port Shepstone	Verulam	Vryheid	Total
No. of Observations	42	11	18	35	33	39	82	35	20	315
Proportion of total answers	13 %	3 %	6 %	11 %	10 %	12 %	26 %	11 %	6 %	100 %

Table 2: General demographics and livestock ownership information collected in the 2002/03 survey in KwaZulu-Natal.

	No. of people in household	Age of interviewees	No. of cattle owned	No. of donkeys	No. of chickens	No. of dogs	No. of goats	No. of horses	No. of pigs	No. of sheep
Median	9	59	9	1.5	15	2	7	2.5	2	9
Min.	1	7	1	1	1	1	1	1	1	3
Max.	60	95	120	10	180	15	102	7	72	185
Number of observations	291	308	276	22	223	192	180	30	17	46

respondents that answered the respective question is reported as *n*.

RESULTS

The collected data on general demographics of livestock owners and their stock are given in Table 2.

The Animal Health Technician (AHT) was found to be the most frequent source of advice for 71.6 % (*n* = 296, range 16.6–90 %) of respondents. A local farmer's cooperative that is a retail outlet for remedies commonly required by farmers, also fulfilled a less important advisory role (22.3 %), albeit large regional differences occurred (range 0–66.7 %). Generally, private veterinarians do not play a pivotal role in health advice, being contacted by only 19.9 % (range 0–50 %) of the owners (*n* = 296).

The great majority of interviewees (82.1 %) knew what Provincial Veterinary Services are and just as many (81.1 %) said they know what Provincial Veterinary Services do (*n* = 296). Almost all (90.5 %, *n* = 296) of the respondents knew their Animal Health Technician. Fewer people appeared to be informed of how Provincial Veterinary Services are organised (47.3 %, *n* = 296). Ninety per cent had a good opinion of veterinary services while 2.4 % said their opinion of PVS was bad. Most people agreed with Provincial Veterinary Services bleeding their animals for surveillance purposes (77.4 %, *n* = 296). Only in 1 district (Hluhluwe, *n* = 35) did 77.1 % refuse to have their animals bled. Most of these owners (51.4 %) did not agree with the procedure because they did not believe it could lead to improved health of their animals, a smaller proportion (11.4 %) objected because they were not given advance warning.

Opinions differed greatly on which type of medium for extension services

would be effective. Most frequently mentioned were farmer's days 46.7 % (range 11.1–80 %, *n* = 315). Radio was also thought to be very useful by 35.6 % (range 9.5–88.9 %, *n* = 315). Around a third (27.9 %) of interviewees considered clinics to be a valuable extension (range 0–90.9 %, *n* = 315). Demonstrations and pamphlets were only regarded as useful by 19.4 % (range 0–84.8 %) and 16.2 % (range 0–50 %) of the owners, respectively (*n* = 315).

Vaccination of stock appears to be common practice (84.8 %, *n* = 290), and varied only slightly throughout the districts (range 71.4–94.4 %). Blackquarter (77.6 %) and anthrax (47.9 %) were the vaccine most frequently used by cattle owners (*n* = 290).

Deworming was carried out by 79.8 % (*n* = 315) of which 63.1 % used only commercial remedies, 10.7 % used only traditional remedies and 6 % used both. A significant association occurred between cattle owners deworming their animals and reporting worms as a problem in their stock in this interview (*P* < 0.005).

Intervals between drenching recorded were: 40.2 % deworm their animals every

6 months, 41.5 % with intervals of over 1 year and only 15.2 % at 3-monthly intervals (*n* = 229).

Over half of the respondents (58.9 % (range 30.8–87.5 %, *n* = 296)) used traditional medicines for their stock. The conditions most frequently treated with these medicines were worms (69.5 % (range 22.2–100 %)) and diarrhoea (50.9 % (range 14.3–81.8 %)). Approximately a third (32.4 % (11.4–57.3 %, *n* = 296)) of the participants stated they do believe that witchcraft plays a role in causing diseases and death of their animals.

In general, the majority of people (62.5 %, range 61.1–100 %, *n* = 296) dip their animals weekly in summer. In 3 of the 9 districts a 2-week dipping strategy is mainly followed. Only very few people (4.4 %, *n* = 296) dip their animals at monthly intervals in summer. In winter, 32.8 % of owners dip their cattle at 2-weekly intervals, 25.3 % monthly and 20.6 % do not dip their cattle. Around a third (35.4 % (range 0–64.9 %, *n* = 315)) of respondent do apply additional control of external parasites such as pour-ons. Details on additional parasite control measures used besides dipping are given in Table 3.

Table 3: Additional means of controlling external parasites used in the 2002/03 survey in KwaZulu-Natal.

District	Pour-on (%)	Tick grease (%)	Injections (%)	Spray (%)	No. of observations
Dundee	40.5	0	4.8	14.3	42
Durban	9.1	27.3	0	9.1	11
Estcourt	0	0	5.6	0	18
Hluhluwe	22.9	2.9	5.7	28.6	35
Ixopo	21.2	12.1	21.2	9.1	33
Pietermaritzburg	12.8	0	0	7.7	39
Port Shepstone	64.6	0	11	0	82
Verulam	48.6	8.6	0	2.9	35
Vryheid	15	20	15	10	20
Overall	35.2	4.8	7.6	8.3	315

Table 4: Health problems in cattle noted by owners in the 2002/03 survey in KZN.

	Overall (%)	Range between districts (%)
Respiratory	3.2	0–30
Diarrhoea	27.2	2.9–51.3
Ticks	77.7	27.8–94.9
Lameness	10.7	0–88.9
Mastitis	13.6	0–35
Nutrition	12.9	5.9–40.0
Reproduction	10.4	2.9–27.8
Skin	14.2	0–30
Worms	59.5	38.0–79.4

Disrepair of the diptank was the most frequently mentioned problem encountered in the dipping procedure (33.3 % (range 19–80 %, $n = 315$)). Unavailability of dipping material was a problem for every 5th owner overall (22.2 % (range 0–85.7 %, $n = 315$)). The 3rd most frequently mentioned difficulty was the duration of the dipping procedure (18.4 % (range 0–50 %, $n = 315$)). Another problem stated was the unavailability of water (3.8 %, $n = 315$). The results of health problems noted by owners are given in Table 4. Ticks and worms were the most frequently mentioned problems, followed by diarrhoea.

Overall, diseases (56.1 % (range 23.1–91.4 %, $n = 296$)) and lack of knowledge (51 % (range 22.2–86.6 %, $n = 296$)) were the most frequently mentioned problems. Poor facilities (36.8 % (range 2.9–68.3 %, $n = 296$)) and theft (31.8 % (range 20–92.9 %, $n = 296$)) can also be considered important problems. Difficulties associated with a lack of markets (15.5 % (range 0–34.1 %, $n = 296$)) and of economic origin (16.9 % (range 0–36.4 %, $n = 296$)) appeared to be less strongly felt. On average 2 (1.3–3) problems were mentioned per person. Milk is not sold by the large majority of respondents: only 2.7 % ($n = 296$) stated they sell their milk.

DISCUSSION

The results of this survey may have been influenced by several sources of bias such as the convenience selection of interviewees during the dipping procedure, as this approach limited the response group to cattle owners who cooperate with Provincial Veterinary Services and practise dipping. Collecting the information in the above manner constituted a practical and cost-efficient way of gathering important information.

Considering the demographics, parallels to other studies conducted in the rural context are present. For example the average number of 12 cattle owned in this study does not differ much from that found by Dreyer *et al.*¹ and also the species

owned and their relative frequency simulates findings from other South African rural areas¹¹. Deworming appears to be a frequent practice, but efficacy may be questionable, as owners deworming their animals were also significantly ($P < 0.05$) more likely to state that worms were a health problem in their cattle. This fact and that long intervals between worm treatments occurred, support the likelihood of inefficacy of internal parasite treatment, an effect that was also observed by Getchel *et al.*⁴, who also found that the medication is often severely underdosed. To address this, deworming practices and treatments applied should be further investigated and advice on appropriate treatment, as well as management practices should be integrated in the programme of farmer's days and other information pathways.

Many owners used additional external parasite control such as the use of pour-ons. The application of such measures could indicate that tick control by means of dipping is considered not sufficiently effective. It was observed during another study in this area that owners preferred to have their cattle relatively free of ticks,² a finding that was repeated in a study in a different rural area, where owners went to great lengths to render their cattle completely tick-free¹⁰. This practice is likely to have contributed to an endemic instability for babesiosis in KwaZulu-Natal that was observed in the serological survey of which this study was a part⁵. Ticks were also mentioned as the most important health problem in most of the districts, reflecting the findings of Dreyer *et al.*¹. It remains unclear, however, whether the health problem refers to the ticks themselves, resulting abscesses or associated diseases.

The results of another study found the killing of ticks to be the most important reason for tick control followed by disease control and damage to teats, which gives the impression that the ticks themselves might be considered the problem⁶. The high proportion of owners dipping their cattle, although corresponding with findings of another study,⁹ should be interpreted with care, due to the above mentioned bias of selecting interviewees during the dipping procedure, which occurred in both studies.

Similar to the findings of another study investigating the use of herbal remedies by Masika *et al.*¹⁰, traditional medicines appear to play an important role in the treatment of animals in this context. Knowledge of herbal medicine values further exploration, as previous research has shown that many plants in use in South Africa do show marked pharmaco-

logical activity³. No association was found between the use of traditional medicine and believing in witchcraft, which may indicate that use of traditional remedies and traditional beliefs are not necessarily linked.

As in other rural areas⁸, diseases, together with lack of knowledge are considered to be an important management problem.

The answers to the question on management problems though were somewhat pre-determined through the use of multiple choice questions.

Preferences for the channels of communication of extension measures varied among the districts in this survey, but this variability might have been caused by the fact that owners preferred the types of extension work they were already exposed to and which were not uniform throughout the province. Animal health technicians were shown in this survey to play an important role in advising local farmers – the implied trust is very important in the implementation of future extension services.

Since any animal health initiative is known to be effective only if it is supported and understood by the local farmers and reflects their needs¹³, further research on where knowledge gaps exist and what additional knowledge would be perceived as beneficial, is essential before more specific programmes for extension work can be designed.

Participatory workshops and focus groups have been found very useful in this context^{7,11} and could be initiated by taking the results of this survey back into the community for discussion.

The knowledge accumulated through such an approach, could then be used to further train Animal Health Technicians and community based animal health workers, in better ways to advise cattle owners on management and animal health issues. Such extension work is very important in controlling diseases in such communities and forms an important component of a holistic approach to disease management that includes other disciplines such as agriculture and sociology^{7,13}.

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