

Raising livestock in resource-poor communities of the North West Province of South Africa – a participatory rural appraisal study

J K Getchell^a, A F Vatta^{b#}, P W Motswatswe^c, R C Krecek^d, R Moerane^c, A N Pell^a, T W Tucker^a and S Leshomo^c

ABSTRACT

A participatory research model was used in six village communities in the Central Region of the North West Province of South Africa in order to achieve the following broad objectives: to obtain information on the challenges owners face in raising livestock in these areas and to evaluate the livestock owners' level of knowledge of internal parasites in their animals. Information obtained at participatory workshops clearly indicated a need for improvements in water supply, schools, job creation, and health services. Lack of pasture for grazing livestock was also cited as being important. Other most frequently mentioned livestock problems included 'gall sickness' (a vaguely defined condition not necessarily referring to anaplasmosis), parasites (both external and internal), chicken diseases and ingestion of plastic bags discarded in the environment. When livestock owners were questioned during individual interviews, most were able to identify the presence of parasites in either the live or dead animal. However, it seems likely that this is limited to the identification of tapeworms. It was found that most livestock owners use a combination of treatments, ranging from traditional to folklore to commercial. There were some difficulties in using the participatory methods since it was the first time that the facilitators and the communities had been exposed to them. Many communities had difficulty in dealing with the concept of finding solutions within the community, which is such an integral part of participatory methods.

Key words: ethnoveterinary treatments, livestock problems, participatory rural appraisal, PRA.

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INTRODUCTION

While a survey of internal parasites of domestic ruminants was being conducted in the North West Province using faecal egg counts and identification of 3rd-stage nematode larvae², a simultaneous survey on farming systems and on livestock owners' attitudes in resource-poor areas was undertaken. This also complemented other research undertaken on worm-control methods for goats in the province^{3,12,13}. The present study was undertaken to ensure that recommendations on parasite control could be implemented by the livestock owners. The broad objectives of the study were to obtain information on the

challenges livestock owners face in raising livestock in these areas and to evaluate the level of livestock owners' knowledge of internal parasites in their livestock. To achieve these aims, participatory rural appraisal (PRA) methods were used in a project that ran from May to August 2000 in the Molopo and Ditsobotla districts in the Central Region of the North West Province, South Africa (Fig. 1).

The villages included in the study are rural settlements of Setswana-speaking people with tribal heads belonging to the Barolong tribe. The area formed part of the previous Bophuthatswana homeland. Dwellings are sparsely distributed on tribal-owned land and animals are grazed communally. The census data for the districts are given in Table 1. The Molopo and Ditsobotla districts are part of the summer-rainfall region of South Africa, most of the rain falling between October and April. The mean total annual rainfall for Mmabatho is 539 mm (South African Weather Bureau). The average

minimum and maximum temperatures that are characteristic of this area are 11.5 °C and 26.4 °C. The vegetation types comprise Kalahari Thornveld, Sourish Mixed Bushveld and Dry *Cymbopogon-Themeda* Veld¹.

MATERIALS AND METHODS

Planning

Villages in which the PRA workshops were held were chosen because the livestock owners had expressed an interest to take part, the headmen offered viable suggestions, these villages contained livestock owners who had previously participated in the internal parasite survey conducted in the province and because accommodation was available for JKG close to the pre-selected villages. Because it is important that PRA facilitators live in the community, a house owned by the government was located for use by JKG in the village of Modimola in the District of Molopo.

Before launching the project, a meeting took place between the paramount chief and council of the 2 districts in which the work was to take place, the headmen of the villages were notified, and, for the Ditsobotla District, posters were put up in oft-frequented areas such as community halls, phone centres and stores.

Most of the workshops were facilitated by 2 animal health technicians (AHTs) employed by the Directorate of Veterinary Services (DVS) of the North West Province. S Leshomo facilitated the workshops in the villages of Seboana, Kromdraai and Vryhof (Molopo District) and P Motswatswe in Madibogo, Kraaipan and Setlagole (Ditsobotla District). P Motswatswe attended a seminar on PRA at the University of Pretoria outlining the techniques and methods to be used and both AHTs attended a presentation given on participatory rural appraisal to AHTs of the DVS in Mafikeng. In sessions lasting an hour before the workshops, JKG and AHTs met to discuss the exercises that would be used and the reasons for using them. Examples from books on PRA were utilised. The role of the facilitator was explained, namely to maintain a respectful

^aCornell University, Ithaca, New York, 14853 USA.

^bOnderstepoort Veterinary Institute, Private Bag X05, Onderstepoort, 0110 South Africa.

^cDepartment of Agriculture, Conservation and Environment, North West Province, Private Bag X2039, Mmabatho, 2735 South Africa.

^dDepartment of Veterinary Tropical Diseases, Faculty of Veterinary Science, University of Pretoria, Private Bag X04, Onderstepoort, 0110 South Africa.

#Deceased.

Author for correspondence.

E-mail: adriano@moon.ovi.ac.za

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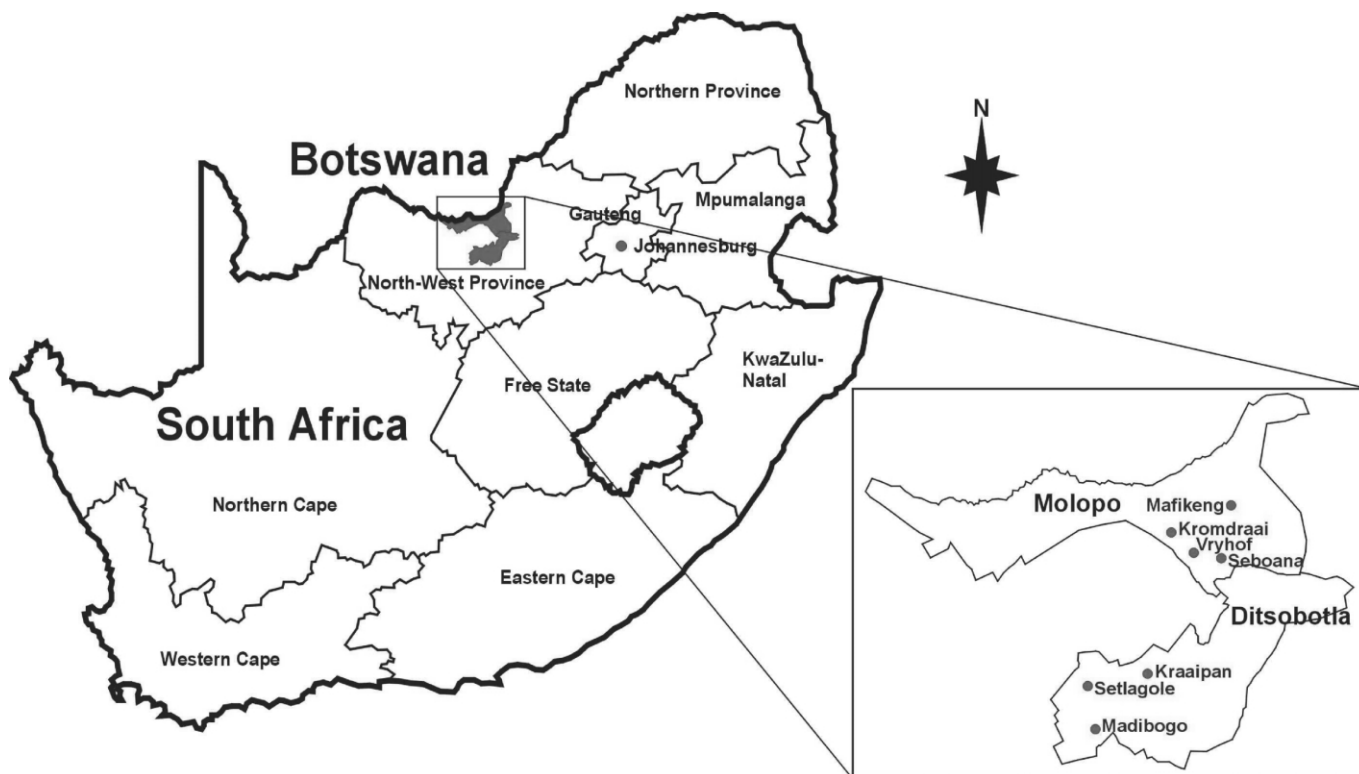


Fig. 1: Villages included in participatory rural appraisal workshops in Molopo and Ditsobotla State Veterinarian Areas, North West Province, South Africa.

attitude to groups, to listen to the villagers, and to promote genuine participation of all members of the community. The principal AHTs and JKG were assisted by other members of the DVS as well as interns from the local university.

Both technicians geared their publicity about the meetings towards livestock owners, a population assumed to be predominantly male⁵. Hence the meeting participants were predominantly male, except in the village of Kraaipan where relatively more women were present than in the other villages. In that village, a good mix of occupations among participants was also achieved.

Workshops were generally held and completed in the morning and 2–3 workshops were convened per village.

Methods

Techniques used in the study included participant observation, various PRA tools and informal farm interviews. Workshops were conducted in Setswana and English with the AHTs providing translation whenever possible. Meetings were held at community halls or in the case of Vryhof, near a crush-pen.

JKG was responsible for participant observation throughout the research process, as one of the methods of addressing the research objectives. She attempted to place herself visibly in the process by participating in the project activities, living in the village and spending time in the other villages. An attempt was made to learn and understand what was going on by talking to people in the community and taking part in such activities as community livestock vaccination days, a new chief's inauguration and community meetings not related to the workshops.

At the 1st meetings, a discussion of the village history, population, employment, committees and previous projects was entertained. These exercises usually took about 1 hour. Thereafter, or in a subsequent meeting, various participatory tools were employed in the different villages (Table 2).

Village mapping is a graphical representation of the community that is used to develop a view of the community from the residents' perspective^{4,10}. This is accomplished by identifying natural resources, boundaries, infrastructure and other characteristics. Village maps should

contain elements such as elevation, schools, water sources, pastures, homes and other important structures. Groups were divided into local wards to draw community maps. Most of the groups were gender mixed, but in Kraaipan 1 group included only women. Ideally, the villagers should have drawn the maps themselves, but occasionally the AHTs or students from the local university drew the maps with input from villagers. On average, the village mapping exercises took 1½ hours to complete.

Transects are a 'cut' of the community or farm and are used to identify the production characteristics of the community or farm and to determine some of its problems and potentials^{4,10}. They should include the types of crops grown, as well as information on livestock, tree species, and soil management. Ideally, the community should walk around the village pointing out features and problems in the village. Because the villages are very spread out, making it difficult to do a proper transect without devoting an entire day to the project, the only village in which a complete transect was done was Madibogo that took about 1 hour.

Table 1: Census data for Ditsobotla and Molopo districts, Central Region, North West Province, South Africa.

District	Cattle	Goats	Sheep	Horses	Donkeys	Mules	Pigs	Dogs	Poultry
Ditsobotla	51018	37254	39883	1710	3137	0	2282	8374	73220
Molopo	49147	24885	22648	1254	4896	318	861	4475	15739

Table 2: Participatory exercises employed in the Molopo and Ditsobotla districts, Central Region, North West Province, South Africa.

Village	Village mapping	Transects	Seasonal calendars	Problems and solutions matrix
Molopo District				
Seboana	✓	✓	✓	✓
Kromdraai	✓	✗	✗	✓
Vryhof	✓	✓	✓	✓
Ditsobotla District				
Setlagole	✓	✗	✓	✓
Kraaipan	✓	✗	✓	✓
Madibogo	✓	✓	✓	✓

Seasonal calendars are a way to show production cycles throughout the year^{4,10}. They also include seasonal problems such as when parasites or Newcastle disease pose greater risk. These exercises are designed to develop consensus about when tasks such as planting and harvesting are done.

Generally at the last meeting in each village, livestock problems were talked about and ranked and then different solutions were explored (problem and solution ranking). Emphasis was placed on identifying treatments (traditional, folk-lore and commercial) that livestock owners utilised for curing sick animals. Whenever possible, samples of plants used for medicinal purposes were obtained and identified.

While conducting the participatory workshops, 13 households were identified by the AHTs for follow-up informal farmer interviews. Most of the interviews took between 2 and 3 hours to complete. Although initially only emerging commercial farmers were being interviewed, livestock owners at a more subsistence-level were also identified, to get a balance of different incomes and farming expertise. First a walk around the farm took place as the farmer explained different features of the homestead including water sources, soil types, and problems he/she might have. This walk-through was used to learn how the land was used, what crops were cultivated, and how animals were raised. During all interviews various questions were asked about the livestock owners' knowledge of livestock, parasites and treatments.

Farm maps similar to village maps were drawn to show the farm and features such as the kraals, water sources, pastures and other items. The owners of the farms should have drawn these maps, but this was done in less than half of the cases, usually because the livestock owners refused to draw them. In these cases, the AHTs drew the maps. In some cases the participants walked across the farm in transects to determine how land was used for kraals and gardens and what portion

of the farm was unusable bush. This also helped to identify pests, elevation inclines, soil types and water sources.

RESULTS

Background information

Differences in the amount and type of information obtained resulted from variation in the number of meetings per village, different facilitators and dissimilarities in the communities. Most of the communities of the present study reported a lack of sufficient potable water for themselves and their livestock. Schools appeared to be inadequate, either non-existent or unable to cater for all school grades, in most of the villages visited. Unemployment was cited as a major problem in the communities. In many of the communities, there appeared to be a need to establish or improve the health services. The participants at the workshops cited the lack of available pasture for their livestock as one of their most important concerns. These complaints were perhaps most clearly expressed by the people of Kromdraai. Here, the main observation from their map-drawing exercise was that they stated they had no roads, no electricity, no schools, no water, no health clinic, no shops, no sanitation, and no associations or groups. The interaction with the livestock owners seemed to generate a high level of frustration and, as a result, the participatory work was halted abruptly in this community at the 2nd meeting.

Participants at the workshops said that their villagers were employed as mine-workers, domestic workers, teachers, dressmakers, builders, casual labourers to harvest crops (e.g. peanuts) on neighboring commercial farms, or as petrol attendants (Setlagole). Other villagers were self-employed as crop or livestock farmers.

Although numerous committees were cited, it appeared that many of these committees met infrequently or no longer existed. For example, in the village of Kromdraai, a committee was formed to seek government funding for a village

borehole to decrease the amount of time women spent collecting water. The committee met only a couple of times and disbanded after it appeared that the government was not going to provide a borehole.

Livestock problems

Livestock problems mentioned by the villagers are recorded in Table 3. In some cases, these were ranked and where this was done, this has been indicated in Table 3 by means of an asterisk. Problems most frequently mentioned were 'gall sickness', parasites (both external and internal), chicken diseases, ingestion of plastic bags, and lack of sufficient water and pasture for livestock (as mentioned above). 'Gall sickness' seems to be a vaguely defined condition of unthrifty animals. It is not a specific disease caused by specific organisms or conditions. Livestock owners said that they often notice enlarged gall bladders in their animals when they die and expressed a desire to learn more about its causes. Although certain livestock owners (for example, some from Vryhof) indicated that they were able to obtain information about animal diseases and their treatments from an agricultural cooperative*, others (for example, those of Kraaipan) complained that they did not have enough information about diseases and vaccinations.

Traditional treatments

Within the ambit of general discussions concerning livestock problems and their possible solutions, various traditional treatments were mentioned (Table 4). Many livestock owners, including both men and women, contributed to the discussions about traditional treatments. Of these, about half are used to treat 'gall sickness' in addition to other ailments.

Informal farmer interviews

During the workshops it was observed that there is general knowledge about

*In the South African context, this refers to rural stores which sell such products as dips, dewormers, vaccines, stock remedies, agricultural implements, fertilisers, seed and protective clothing.

Table 3: Livestock problems mentioned during participatory rural appraisal sessions held in villages of Molopo and Ditsobotla districts, North West Province, South Africa.

Seboana	Kromdraai	Vryhof	Madibogo	Kraaipan	Setlagole
*'Gall sickness'	Lack of water	Nervous symptoms ^a	*'Gall sickness'	*Chickens ^b	*'Gall sickness'
*Plastic and bone ingestion	Animals hit by cars on highway	Dry rash on ears and around face	*Worms and sheep scab	Newcastle disease	*Tick-borne diseases
*Stiff sickness	Refuse ingestion	Roundworms in sheep	*Lumpy skin disease	Fowl pox	*Black quarter
*High mortality in poultry	Stock theft	Sheep scab	*Newcastle disease and fowl pox	Worms	*Bottle jaw
*Long hooves in cattle	Worms in horses	Plastic ingestion	*Ticks	Lice	*Newcastle disease and fowl pox
Abscesses in organs	Parasites (worms and ticks)	Ticks on cattle, sheep and goats	Bloat	*Cattle, sheep and goats	*Footrot
Abscesses on the body	Abscesses	Black quarter	Ingestion of poisonous plants	'Gall sickness'	*Botulism
Abortions in cattle at 3 months	No or ineffective remedies	Newcastle disease	Sheep scab	Worms	*Measles in pigs
Improper castration	No grazing camps	Botulism		Metabolic diseases <i>e.g.</i> hypocalcaemia and ketosis	*Eye problems
Dry muzzle in cattle with bleeding thereafter and coughing	No state veterinary services	Heartwater ^a		Leg stiffness	*Abscesses
Worms	Rabies vaccine killing dogs	Tampans in chickens		*Dogs and cats	
Abortions in horses and donkeys		Sores on chickens' combs		Parvo virus	
Death with foam from the nose and mouth				Lice	
				Foot rot	
				No veterinary services	

*Ranked in order of importance, with other problems mentioned recorded in no particular order thereafter.

^aHeartwater is a possible cause of nervous symptoms, though recorded here as separate conditions because it was not clear whether the two did refer to the same condition.

^bChicken problems may have been ranked 1st owing to the fact that there were many more women than men at this meeting and women tend to be the primary caretakers of chickens.

bottle jaw, diarrhoea and lesions on internal organs, which may all be caused by parasites. It is unclear, however, whether livestock owners couple these signs with the presence of parasites, particularly nematodes. Samples were shown of parasites and treatments were talked about. Livestock owners were not able to identify specific types of parasites, nor did they know how the animals became infected. None of the livestock owners interviewed or talked to at workshops knew about parasite management techniques such as pasture rotation, grass-free kraals, and other methods they might use to help prevent infection. However, livestock owners made it clear that they would like more information about preventing and treating parasite infection.

Nine of the 13 livestock owners interviewed said they had seen parasites in live animals (Table 5). All described seeing white flakes in the stools, which were most likely segments of tapeworms. However, many livestock owners were unaware of the more harmful nematodes. Nine of 13 said they had seen parasites during *post mortem* examinations. Seven of the 13 had identified parasites in both dead and live animals, while several saw parasites exclusively either in live or dead animals.

Ten of the 13 livestock owners frequently used traditional treatments, often in conjunction with commercial treat-

ments. When possible, livestock owners were asked to show the interviewers the medicines they were using and how much they were giving. Often the livestock owners were severely under-medicated while drenching. One illiterate farmer who relied on the reading ability of his children was administering 2 ml instead of the prescribed 20 ml of a drench treatment. Several livestock owners were using dangerous non-veterinary disinfectants such as Jeyes fluid™ (carbolic acid, Adcock Ingram) on their animals for treating external parasites. In many cases, it was observed that livestock owners administered the wrong types of medicines to treat their livestock. Terramycin™ (oxytetracycline, Pfizer Animal Health) appears to be widely used for all illnesses in livestock. Interesting too is the fact that all livestock owners interviewed stated that they provided supplementary feed to their animals.

Another problem we observed is that vaccines for such diseases as anthrax and lumpy skin disease were not properly stored before use. The lumpy skin disease vaccine requires refrigeration, but on several occasions it was brought warm to JKG and the AHTs. It is possible that livestock owners may not have electricity in order to store the vaccines properly. When the 2 livestock owners who had brought the warm vaccines were asked about temperature control, they said they

did not know they needed to keep the medicines cool.

General

The ranking of problems and exploring solutions for these caused the most problems, and the livestock owners did not fully accomplish the objective of this exercise. Problems arose because the community members chose to focus on the problems without fully considering possible solutions, which were essentially limited to discussions of traditional treatments of livestock problems. The exception here was a suggestion by one of the livestock owners of Madibogo. During the exercise it was realised that chicken diseases were a community problem, that buying vaccines by individuals was not feasible and hence that a community committee needed to be established to purchase vaccines.

DISCUSSION

A number of studies have been carried out that focus specifically on the role of animals in resource-poor communities of South Africa. They have focused on donkeys¹⁴, dogs⁹, tick-borne diseases and tick control in cattle^{7,8} and general animal husbandry⁵, amongst others. The present study is unique in that it reports specifically on the use of PRA within communities in the Central Region of the North West Province.

Table 4: Treatments used by livestock owners of Molopo and Ditsobotla districts, Central Region, North West Province, South Africa.

Treatments	Condition	Species	Village
Boiled roots of <i>mokgalo fatshe</i> (<i>Olinia emarginata</i> , mountain hard pear)	Diarrhoea	Lambs, goat kids	Vryhof
Terramycin™ (oxytetracycline, Pfizer Animal Health)	All ailments	Sheep, goats, cattle	Vryhof
1ℓ African beer	Lethargy	Cattle	Vryhof
1 spoon brown sugar, 1 spoon salt, ½ℓ water	'Gall sickness'	Mostly cattle	Vryhof
Cow dung	Wounds, hair not growing	Donkeys	Vryhof
½ℓ water and vinegar	Diarrhoea suspected to be caused by tapeworm	Lambs	Vryhof
1ℓ water, 2–3 spoons Kerol™ dip (phenoloids, carbolic acid, Coopers Animal Health)	Bottle jaw	Sheep	Vryhof
<i>Mathubadifala</i> (<i>Eucomis</i> sp., pineapple flower)	Retained placenta 'Gall sickness'	— Mostly cattle	Vryhof Setlagole
Fish oil	'Gall sickness' Constipation Plastic ingestion	Mostly cattle — —	Madibogo Kraaipan Setlagole
Sorghum beer	'Gall sickness'	Mostly cattle	Madibogo Kraaipan Setlagole
1 cup brown sugar, 1 cup vinegar, 1 cup clean cold water	'Gall sickness'	Mostly cattle	Madibogo
Potassium permanganate	Any sickness	Chickens	Kraaipan
Aloe	Worms Diarrhoea	Chickens —	Kraaipan
Tobacco leaves	Worms, foaming from the mouth	—	Kraaipan
<i>Sebete/Sebetebete</i> (<i>Senna italica</i> , Eland's pea)	Liver disease 'Gall sickness'	— Mostly cattle	Kraaipan Setlagole
<i>Makgabenyana</i> (<i>Bulbine</i> sp.)	'Gall sickness' Worms	Mostly cattle —	Kraaipan, Setlagole Setlagole
<i>Sekaname</i> (<i>Urginea sanguinea</i> , Transvaal slangkop)	'Gall sickness' Worms	Mostly cattle —	Kraaipan, Setlagole Setlagole
Coca-Cola™	'Gall sickness'	Mostly cattle	Kraaipan
Salt and aloe	Constipation	—	Kraaipan
Tobacco leaves and brown sugar	Worms	Horses	Kraaipan
Jeyes fluid™ (carbolic acid, Adcock Ingram)	'Gall sickness'	Mostly cattle	Kraaipan
<i>Monyokololo</i> plant	'Gall sickness' Worms	Mostly cattle —	Setlagole
Coca-Cola™, bicarbonate of soda, brown sugar, vinegar	Bloat 'Gall sickness'	— Mostly cattle	Setlagole
<i>Phate ya ngaka</i>	Fowl pox, any swelling of the head in chickens	Chickens	Setlagole
Aloe, potassium permanganate, blue stone	Worms, diarrhoea	—	Setlagole
White sugar and a millipede (<i>sebokolodi</i>)	Eye infections	—	Setlagole
<i>Tube ya poo</i> ('bull's tube') plant	'Gall sickness'	—	Setlagole
Motor oil	Eye infections 'Gall sickness'	— Mostly cattle	Setlagole
Jeyes fluid™, paraffin, flowers of sulphur, salt	Worms	—	Setlagole

— = No data.

Table 5: Results of individual farmer interviews.

Livestock owners ^a	Age	School grade completed (1–12)	Number of cattle kept	Number of goats kept	Number of sheep kept	Number of chickens kept	Sees parasites in live animals	Sees parasited in dead animals	Uses traditional treatments	Uses commercial treatments
M1	64	6	40	30	40	11	Yes	Yes	No	Yes
M2	72	12	81	50	35	75	Yes	Yes	No	Yes
M3	78	–	16	13	5	20	No	No	Yes	No
M4	75	–	4	5	–	10	Yes	Yes	Yes	No
M5	59	–	60	6	20	20	Yes	Yes	No	No
M6	28	9	24	9	23	7	No	No	Yes	Yes
M7	38	5	25	–	23	18	No	Yes	Yes	Yes
M8	50	3	2(10) ^b	10	9	18	Yes	No	Yes	Yes
M9	82	–	13	–	23	11	No	Yes	Yes	No
M10	62	–	26	4	10	22	Yes	Yes	Yes	Yes ^c
F1	53	7	8	–	–	4	Yes	No	Yes	Yes
F2	60	7	–	–	–	6	Yes	Yes	Yes	–
F3	38	6	2	–	–	6	Yes	Yes	Yes	Yes

^aM: male livestock owner with a number; F: female livestock owner with a number.

^bHas only two cows but takes care of 10 additional animals for another owner.

^cHas not seen signs of parasites for two years but has treated in the past when he saw signs.

Several constraints limited the field research. The 1st one was a time constraint, both for JKG and the AHTs. The latter had other duties and jobs to perform in addition to working on this project and JKG relied on them to take her to the villages and to act as translators. The plan to work in several villages was ambitious, which meant that the amount of information obtained from each village was less than would have been obtained if only 1 or 2 villages had been included in the study.

The 2nd constraint was that the PRA was not led by the community, but by the AHTs. PRAs should be community led, ideally by a team from the community. During a meeting in Seboana, for example, the participants often deferred to the facilitator in identifying the events for the seasonal calendars. This problem, which is common in PRA activities, can only be resolved if the facilitator turns responsibility back to the community group. It is more likely to arise if an external facilitator is used rather than relying on a community member.

A 3rd major constraint is the history of the region. In the past, the Department of Agriculture provided many free services, but since 1994 livestock owners have had to pay for these services. The policy of the new South African government is to create a people-centred government. The government has committed itself to addressing poverty in the poorest parts of the country, which are primarily in rural areas. The emphasis is on empowering people to create a self-reliant society¹¹. Most of the communities, accustomed to getting services free, had some difficulty in accepting the idea that they would need to become more self-reliant in finding solutions to many of their problems. If there had been adequate time, it may have been beneficial to have allowed the livestock owners of Kromdraai, for example, to list all of their complaints until they were 'complained out'. Then, they should have been encouraged to identify which problems they could take steps to resolve and they should have been encouraged to implement these changes. Clearly, it was not possible to devote as much time as would have been needed to adopt this approach, given the time constraints. Nevertheless it was clear that through more time and experience with the workshops the communities will be able to do more to help themselves. This was demonstrated by the community member at Madibogo talking about taking charge of their need to vaccinate their chickens. It was also clear that the AHTs had learnt a lot through the exercise, one of them remarking that it was the 1st time

that he had actually really listened to the livestock owners.

A 4th constraint was the inability of JKG to speak Setswana. She had to rely on translators, when available, or have the AHTs explain to her what had happened or what had been said after the fact. Sometimes she did not get any translation for the entire workshop.

Many of the livestock problems mentioned are rather vague and would require further diagnostic investigation and research to determine the underlying aetiologies and how best to prevent and treat the diseases.

The information given in Table 4 is incomplete and in particular details of the preparation of the herbal medicines are missing. Old motor oil and Jeyes fluid™ have been used for tick control in cattle in the Eastern Cape Province of South Africa⁸ and for ailments in donkeys¹⁴. It is of interest that one of the most widely mentioned herbal treatments, *Urginea sanguinea* (*sekaname*, Transvaal slangkop), is a highly toxic plant.

RECOMMENDATIONS

Given the problems of insufficient potable water and lack of sufficient pasture for grazing, a problem shared by other communities of the North West Province⁵, the problems of livestock diseases pales somewhat into insignificance. Government officials may also perhaps be more inclined to address the problems of inadequate schooling and poor human health services as priorities. Nevertheless the livestock, particularly small ruminants, have the potential to be amongst the communities' most valuable assets, particularly for those members with no formal employment. As such, contact sessions were arranged with communities during June and July 2001 and recommendations for improvement in the field of livestock production were put to the communities for their comment. Unfortunately, only up to a third of the people attending the report-back sessions had taken part in the PRA exercises, which meant that for many the PRA approach was new and unfamiliar. The interaction proved difficult as a result, but pertinent comments from the communities with regard to the recommendations are recorded together with the recommendations below.

Water resource information

There seemed to be frustration in some of the communities regarding how to get the government to install windmills or boreholes nearer to their settlements. The communities were encouraged to liaise with the relevant government or commu-

nity worker to investigate options and to facilitate applications for obtaining windmills, boreholes or piped water, or for improving the use of donkey traction¹⁴.

Lack of pasture for grazing livestock

The question of lack of pasture certainly does constrain reproduction, mass gain and milk production. This is a difficult area to address, and was in fact not discussed in any great depth at the follow-up contact sessions, as issues of land tenure as well as the costs and difficulties of confinement and pasture improvement must be addressed. However, if people seriously want to improve their income from livestock, these issues will need to be considered. Work must be done to investigate such details as the total area available, its vegetation and the stocking rate of livestock.

Farmer organisations

Many of the workshop outcomes revealed that the livestock owners did not have any organised farmer associations. Those who had mentioned organisations said that they had only met a couple of times. Forming farming organisations that meet frequently and stay together for longer periods would be a way for livestock owners to share information, pool resources and plan vaccination campaigns.

As discussed above, at one of the meetings a farmer said that the community needed to approach the problem of Newcastle disease by working as a community. It would be possible for the community to pool its resources to buy the vaccine and make sure the birds are vaccinated, to prevent future epidemics. Vaccinating a number of villagers' birds at the same time will also utilise the vaccine package better, which often comes in packages of 1000 doses. The committee could also help to keep track of when a community needs to vaccinate. At present, people often try to vaccinate only after a disease outbreak has occurred. In addition, many vaccines require refrigeration and many communities do not have electricity available. In a group effort, a place to keep the vaccine may be found either at a store, health clinic or school that is electrified. At the report-back at Kraaipan, a woman reported that a chicken organisation had been established following the PRA exercises, and was apparently still active.

Structures for public administration, churches and agricultural co-operatives should also be investigated in more detail as possible venues or catalysts for regular meetings of farmer groups.

Community animal health workers

As budgets are cut and the DVS must do more with less, the animal health technicians must cover huge areas with greatly limited manpower and resources. One possible solution is to train community animal health workers (CAHWs)⁶. A farmer from the community would be given basic training in vaccination, disease recognition, and treatments. Since the CAHWs live in the community, members from the community could come to him/her when a problem has occurred with their livestock. A small stipend or other incentives could be provided to the CAHW. For example, 1 village was concerned that castrations were not being done properly. It might be possible to identify a farmer who is comfortable with castration methods to show the other livestock owners how to do it. For example, during the report-back at Kraaipan, 1 farmer indicated in an assertive manner that he could castrate pigs.

Livestock problems

Future workshops by the AHTs should be given to the communities to train people in the identification of specific diseases. For example, the term 'gall sickness' appears to be used for a wide variety of conditions, including jaundice, distension of the gall bladder with bile, and lesions of the liver⁷. These are general signs of disease and do not indicate a specific aetiology. Without further investigation by means of diagnostic tests or research, 'gall sickness' remains a poorly defined syndrome which cannot be tackled effectively. Investigations into the incidence and mortality of the specific diseases would also be beneficial for disease control purposes. As far as the control of internal parasites is concerned, the livestock owners may have seen segments of tapeworms but it appears that they are not aware that the more dangerous intestinal parasites are microscopic and many cannot easily be seen with the naked eye. This makes one question how much they really know about parasites. Follow-up work to inform livestock owners of what to look for in parasitised animals is needed. The information on traditional treatments is incomplete and follow-up work should investigate these more fully. Livestock owners did request more information concerning the correct use of medications. It is important that the owners are better informed about the commercial remedies and treatments they are using, including what a proper dosage is, how to estimate how much their animals weigh, how to make sure they are using the

correct remedy for the correct problem, and how to properly store the medicines. This concurs with Masika and colleagues⁷. Indeed, the need for information is expressed by various authors^{5,7,8,14} and appears to be a key factor in follow-up to this work. This was confirmed at the feedback sessions where activities such as a workshop on animal diseases and the informal training of livestock owners in basic veterinary procedures were requested by the communities.

Plastic ingestion

Plastic ingestion by animals was one of the major concerns frequently listed by communities and plastic bags were to be seen everywhere on the ground in the communities visited. With no solid waste management programmes in many of the rural areas, rubbish is either thrown on the ground or burned and the plastic bags often escape, to get caught in the bushes and grass of the pastures. The animals eat the plastic often with fatal consequences. It was learnt at the report-back at Setlagole that this is often compounded by the fact that animals are forced to graze around the homesteads because there are no watering points in the open grazing areas surrounding the villages. While livestock owners want medicines to cure the problems caused by ingested plastic, surgery is often the only cure. Picking up the litter and the provision of bins seem to be the only solutions for preventing intake by livestock. One suggestion was to make this known through school education.

PRA follow-up

The need for PRA and other participatory approaches to help plan and focus future projects and training in these communities is great. Given the novelty of the PRA methods both for the AHTs and the villagers in the North West Province, the work that has taken place so far is considered to be a preliminary exercise rather than a conclusive one. It will be imperative that the AHTs continue to work with these communities. Looking at how to design, follow-up and evaluate development processes in a participatory way is the next step. Outlining each step along the way is important, as is the training of new facilitators. Joint workshops should be held with community leaders and AHTs to train them how to be facilitators. Facilitators should reside in the villages in

which they work if they are to be properly in-touch with their community.

The participatory methods created a great deal of interest for the local people which is important and they also provided the outsiders with a basic knowledge of the area. However, the methods did not in themselves create much action and without the action of the local communities, dependency on the outside institutions such as the DVS continues. This will be an important gap to bridge. Nevertheless, opportunities were observed to develop models for sustainable cost-effective animal disease management in these communities. This was seen, for example, in the fact that many villagers treat animals showing signs of disease, both with commercial and traditional remedies, in their willingness to receive more information and in their co-operation with the external organisations that wish to work with them.

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