SOME ASPECTS OF THE RABIES EPIZOOTIC IN NAMIBIA

F. Mettler

1 General Situation in the Northern Communal Land.

From the socio-economic structure Namibia is divided in a highly populated rural part in the north of the country and a much larger commercial part consisting of large farms with a low population density.

A recent study (Sorin and Mvula, 2001) done on dog-human relationship in part of the north of Namibia showed following results:

- 79% of the homesteads have dogs with an average of 1.3 dogs per homestead, resulting in an estimated 115000 animals.
- Most people have the dogs for protection only, but 33% have them in addition as a source of meat. In the poor areas this percentage is even much higher.
- 97% of all dogs are unrestricted during day and night resulting in 110000 dogs, most of them roaming in search for food, what makes it difficult to distinguish them from stray dogs.
- Six to ten human rabies cases occur in this region per year, with a majority of children under 12 years. They are less afraid especially of young dogs and may not report minor injuries.
- Despite an annual vaccination campaign only 12% of the dogs are - according to this study - estimated to be vaccinated. A number that stays in contrast to the official estimated number of around 35%.
- Reasons why owned dogs are not vaccinated:
  1) 40% of the owners indicated, that they did not know where to go - a point that has to be improved.
  2) 20% said, that the dog was too young, now or during the vaccination campaign.
  3) Some other answers were: did not take the time or dog too aggressive to be handled, or veterinary staff not showing up at meeting point such as crushpen, etc.
- The fact that so many dogs are too young to be vaccinated during the annual campaign indicates that the mean age of dogs is rather low and life expectancy is short. The mean age of the dogs is, according to the study, indeed below 2 years. Among the various reasons, one is that dogs get little veterinary attention – what means no other vaccinations and no treatment of infectious or parasitic diseases. Since many owners have indicated to keep the dogs also for food, it is obviously quite common that people are killing and eating a dog because it is ill.
- Various measures such as wide-spread information, co-operation with communities and especially with schools and hospitals are aimed to improve the situation, however, the high turnover of the dog population makes it difficult with an annual vaccination campaign to achieve the minimum recommended rate of 50% of dogs vaccinated.

1 Central Veterinary Laboratory – Windhoek - NAMIBIA
The number of confirmed canine rabies (Table 16) shows that there is a clear increase in the northern communal land over the last 10 years.

Since the canine brains sent to the Central Veterinary Laboratory in Windhoek are mostly of dogs, which have bitten people, these numbers indicate a real worsening of the situation. And the number of rabid cats additionally supports this trend. The increase of positive cases in livestock is a sequel of this development.

Table 16: confirmed rabies cases in the northern communal land.

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2 GENERAL SITUATION IN THE COMMERCIAL FARMING LAND.

In contrast to the north with its urban rabies situation, there is a sylvatic situation in the commercial areas with the jackal (*Canis mesomelas*) as main vector. A clear correlation can be recorded between the number of confirmed rabid jackals and the number of infected bovines (Table 17). The marked fluctuation of the number of rabies cases has a climatic explanation. After rainy seasons with under average rainfall the animals will increasingly meet at water holes, what leads to more occasions for contact and biting between the jackals and between jackals and livestock. Therefore the figures are further increasing towards the end of the dry season. The number of rabid dogs, however, is in the commercial farming area constant over the years and therefore has no influence on rabies in livestock.

Table 17: confirmed rabies cases in the commercial land.

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<td>1/6</td>
<td>3/4</td>
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</tbody>
</table>

3 THE SITUATION OF KUDU RABIES.

3.1 History.

A first localised outbreak of rabies in kudus (*Tragelaphus strepsiceros*) occurred on a farm in Windhoek district in 1975. But the beginning of a large epizootic among these antelopes took place in February 1977 south of Okahandja. During the following years the disease spread an average of 40 to 60 km per year among the kudu population through most of the central and northern part of the country, except that for 2 years the spreading in easterly direction was prevented by a game fence. The highest number of confirmed cases of kudus was reported in 1980 with a second peak in 1982. Afterwards a continuous decrease was noted. In 1985, 8 years after the first outbreak, the epizootic subsided after causing an estimated loss of 30000 to 50000 antelopes. At the time of the outbreak the land was overpopulated with an estimated kudu population of 1 kudu per 40 ha.
3.2 **Present situation.**

After many years with no confirmed kudu rabies a localized outbreak occurred 1999 south of Waterberg in the Otjiwarongo district with 12 confirmed cases on one farm and on two neighbouring farms 2 cases each.

After isolated rabies cases in the following two years mainly in the Okahandja district, 17 kudus were confirmed positive in 2002 in the Okahandja and Karibib district. And in the current year already 15 animals from the same region have been tested positive. However, according to farmers and veterinarians many hundred kudus have died or have been killed with rabies-like symptoms. And all farmers questioned have responded that there is an overpopulation of kudus on their farms.

The present situation, which shows many similar features to the epizootic 16 years ago, makes it most likely that we may stand at the beginning of another detrimental rabies epizootic in kudus.

3.3 **Some biological facts of the kudu.**

Kudus are usually forming small herds, which averages 5 animals and rarely exceed a dozen. These groups stay close together, they move together and they feed together. Bulls often range over great distances – especially during the rut (June, July) – and make contact with other social groups.

Kudus are browsers and in Namibia they are largely dependent on the leaves of Acacia trees. It has been shown that the sharp thorns of these trees can inflict wounds in the oral cavity.

Since there was no observed increase of vectors such as jackals, an oral transmission of rabies from kudu to kudu has been assumed, especially also because they are feeding close to each other and may have contact with saliva of infected animals also by grooming. Experimentally it has been proven that kudus are susceptible for an oral transmission of the rabies virus (Barnard et al., 1982).

During favourable years with good rainy seasons the number of kudus may increase considerably. However, if this time is followed by dry years the food gets scarce, what forces the animal to feed even in closer contact. Such conditions with an overpopulation of the antelopes and with following dry years happened in the outbreak of 1977 and are also now present. Farmers in the vicinity of outbreaks should be advised to reduce the number of their kudus to stop the disease spreading.

The main symptoms of rabid kudus are:

- loss of fear, they do not flee when approached, visit buildings
- moderate to copious salivation
- ataxia, swaying gait followed by paralysis
- some animals behave aggressive

Interesting is the fact that during a kudu rabies outbreak many animals obviously with rabies-like symptoms, which are submitted to rabies testing, proved to be negative. In a study performed by Barnard and Hassel (1981) 27 of 80 kudus, which showed rabies-like symptoms were tested negative. 15% of them had increased salivation and 25% showed docility, many of them visited buildings. No answer for this behaviour could be given.

3.4 **Chronic tannin poisoning.**

Our results revealed that around half of the submitted kudu brains were tested negative. In one case some additional organs were brought in, which showed a severe loss of condition of the animal, despite a full rumen. This created the idea of tannin poisoning in some of the animals, since various factors favourable for a rabies epizootic in kudus are also favourable for chronic tannin poisoning and may even produce similar symptoms:

- acacias contain high levels of condensed tannins (proanthocyanidins)
- the acacias produce more tannin during browsing
- browsing of trees rich in tannin is increased in dry years with an overpopulation of kudus
- condensed tannins in high concentration decreases the absorption of various nutrients especially amino acids (loss of condition, docility)
- salivary glycoproteins are binding tannins (increased salivation)

The hypothesis of enhanced kudu mortality through tannin poisoning in the time of kudu rabies, however, has to be proved.