Disease and health problems of donkeys: a case study from eastern Uganda

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Abstract

Little research information is available on the prevalence of diseases of donkeys in Uganda. A study was undertaken between September 1994 and April 1995 to identify diseases and health problems of donkeys in Uganda. A survey was conducted in Kaptanya sub-County, Tingey County in Kapchorwa District, Uganda. Data were collected by questionnaire from 159 donkey owners in Kaptanya. Forty respondents (25%) were selected by simple random sampling and interviewed. Faecal and blood samples for parasitological study were collected from 40 (20%) of the 210 donkeys in Kaptanya. Disease was most common during the wet season. Mainly young donkeys were affected. The main problems facing donkeys were wounds and injuries, helminthiasis, fly attacks and sudden deaths. Donkey owners and veterinarians should be educated on the presence of diseases in donkeys as well as their prevention and control.

Introduction

The donkey (ass) is a solipede of the family equidae, species *Equus asinus*. It is an important draft animal in many parts of the world. Equids play an essential role in the agricultural economies of underdeveloped countries. However, these animals have not yet been given sufficient care, although they are subject to many diseases, which affect their viability and lower their ability to work (Khalifa, Monib and Mandour, 1988). Despite the increasing importance of donkeys in Uganda, there exists no formal training relating to donkeys. Donkey power is an environmentally friendly means of transport, indispensable in areas of poor roads. Donkeys appear resistant to many diseases. It has also been suggested that the donkey can comfortably pull more weight than it can carry, provided the harness is suitable.

There has been little formal study of the health status of Ugandan donkeys. Therefore it was decided to conduct a survey of diseases associated with donkeys in the mountainous Kaptanya region of eastern Uganda, where donkeys play a dominant role in transport.

Materials and Methods

Study area
This study was carried out in Kaptanya sub-County in Tingey County in Kapchorwa District, in eastern Uganda. This is a mountainous highland region, characterised by cliffs. A sample of donkey owners in Kaptanya sub-County was questioned and samples of faeces and blood were taken from a subset of donkeys.

Data Collection
A survey questionnaire was designed to cover a wide range of issues pertaining to donkeys. The author personally interviewed the respondents in the local language, and recorded their responses. The respondents were donkey owners who were selected by random sampling. The sampling frame of donkey owners in Kaptanya sub-County was 159; each name was written on a piece of paper and folded independently, then by use of simple random selection after thorough mixing, 40 (25%) names were picked out as respondents for the questionnaire.

Blood and faecal samples were taken from 20% of 201 donkeys (40 animals); this was done where congregations of donkeys were found, such as at grain milling centres and markets.

Helminthological diagnostic methods

Collection and analysis of faeces
Faecal samples were taken from the rectum or the ground when the animal was seen defecating (if the animal was not seen defecating, the faeces were collected from those most recently dropped). The sample was collected from several points of the faecal mass.

Helminth ova and coccidia oocysts were recovered by the salt flotation technique. Between10 and 15 grams of donkey faeces were placed in a saturated salt (sodium chloride) solution and the helminth ova and coccidia oocysts were observed under 10 x 10 magnification with a light microscope (Siefert, 1973).

Because fluke eggs, being denser than water, will sink in water, the sedimentation technique was used to recover trematode ova. Approximately 10-15 grams of faeces were mixed in a petri dish with water. The mixture was poured through a household sieve and a funnel into a 250 ml beaker then allowed to stand for 3 minutes. The supernatant was discarded and the beaker refilled with tap water. Filling and discarding the supernatant was done 3 times. After the third time the sediment was transferred into a petri dish, and examined under low power (10 x 10 magnification) (Siefert, 1973).

The Baerman technique was used to recover lungworm larvae. Between 5 and 20 grams of faeces were wrapped in a piece of gauze cloth, and immersed in a funnel with water of already set up Baerman apparatus. After at least 6 hours the spring clip was opened slowly to collect the first drops in a petri dish, and examined under low power of a microscope (10 x 10 magnification) (Siefert, 1973).

Collection and analysis of blood
Blood was collected from the ear vein of each donkey. The base of the ear was held firmly to occlude venous return of the ear so as to raise the vein. With the second hand, the vein was then punctured by quickly thrusting a sharp sterile disposable needle into the vein. The blood then formed a drop on the skin. To collect blood for centrifugation, one end of a microhaematocrit capillary tube of about 3 cm containing an anticoagulant was placed into the drop of blood, then held horizontally, and allowed to fill by capillary action. Blood for smears was taken by dipping one corner of a clean glass slide into the drop of blood. A smaller drop of blood was then held by the corner of the slide, and transferred on to another clean glass slide free from grease.

Packed cell volume (PCV) was determined by the Woo method (Woo, 1970) following centrifugation in a high speed minicentrifuge (Vet Eickemeyer–Germany). Thin and thick blood smears were made for each of the 40 donkeys in order to demonstrate and identify blood parasites. The thin blood smears were dried then fixed in methanol and stained with Giemsa stain. The dried thick blood smears were haemolysed in distilled water and stained with Giemsa stain. Examination of the blood smears was done under oil immersion light microscopy (10 x 100).

Results

Donkey health
Of the 40 donkey owners interviewed, 24 (60%) reported sickness at one time or another in their donkeys. Diseases occurred more often in mid wet season (Figure 1). Young donkeys were affected more often than were adults (Figure 2).

Fourteen (58%) donkey owners who reported illness suggested that diseases originated from pastures. Eight (33%) suggested the market place, one (4%) suggested neighbour's donkeys, one (4%) suggested drinking water, and two (8%) were uncertain of the origin of disease. Thirteen (54%) of the owners who reported diseases mentioned emaciation as one of the symptoms associated with disease; others symptoms reported were unthriftiness (38%), lameness (25%), coughing (21%), distended abdomen (17%), wounds (8%), alopecia (8%) and anorexia (4%). Five respondents (21% reported death of their donkeys. Out of 49 donkeys that fell ill, 26 (53%) died. Death was thought by owners to have been caused by: helminthiasis in eight cases (30%);

Figure 1. Seasonal distribution of donkey illnesses as suggested by donkey owners in Kaptanya Sub-County.

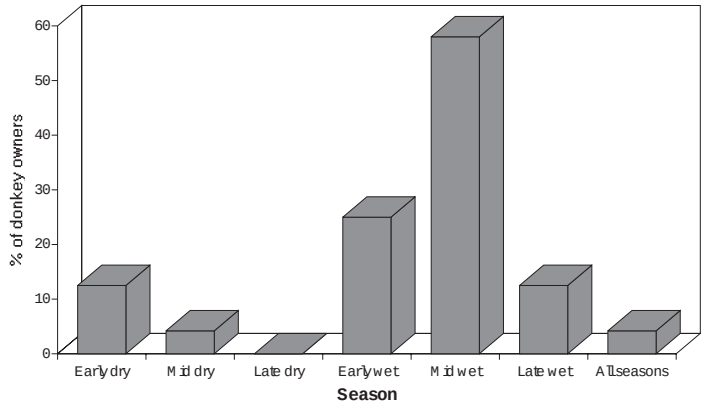


Figure 2. Age distribution of donkey illnesses as suggested by donkey owners of Kaptanya sub-County.

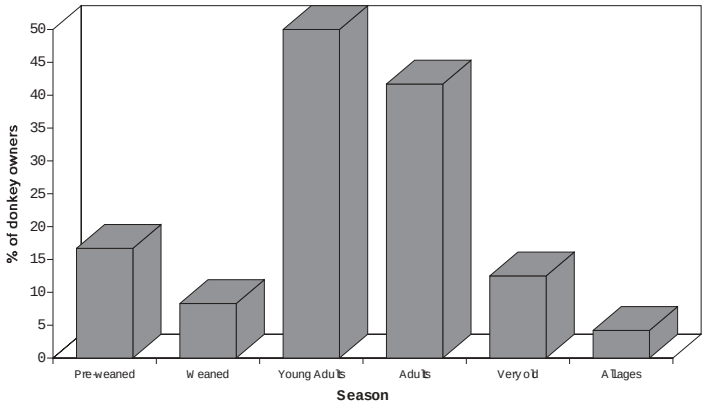
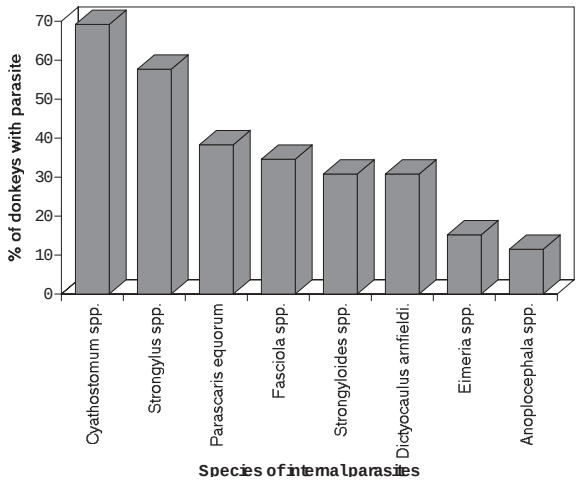


Figure 3. Frequency of internal parasites of donkeys in Kaptanya sub-County.



trypanosomiasis in five cases (19%); pneumonia in three cases (12%); joint sprain, trauma or dislocation in three (8%) cases; colic in two (8%) cases; allergic responses in two cases (8%)and septicaemia/toxaemia in one case (4%). Two donkeys (8%) died of unknown causes.

Digestive system

Out of 40 respondents, 17 (42.5%) mentioned that their donkeys had digestive abnormalities at one time or another. Of the worm eggs examined, those of *Cyathostomum spp* occurred most frequently (Figure 3).

Haemopoetic and lymphatic system

Blood smears of 40 donkeys were examined, 17 (43%) had *Babesia spp*. parasites. No trypanosomes were found. Haematocrit (PCV) was 36.7 ± 4.4% (mean ± sd), with a range of 26 to 46.

Integumentary system

Twenty-three (58%) of the 40 respondents mentioned presence of ecto-parasites on donkeys; 13 (57%) of the 23 respondents mentioned ticks of the genera *Rhicephalus* and *Boophilus*, six (26%) mentioned lice, five (22%) mentioned mites and three (13%) mentioned nuisance flies. There was seasonal variation in the relative abundance of ecto-parasites (Figure 4).

Thirty eight (95%) out of 40 respondents mentioned the presence of biting and nuisance flies. Table 1 shows the incidence of reporting of different fly species. Thirty two (84%) of the 38 respondents who reported presence of biting and nuisance flies suggested there is seasonal occurrence of the flies (Figure 5).

Table 1. Incidence of various biting fly species

	Stomoxys	Tse-tse	Tabanids	Mosquitoes	*Musca* spp.
No. of respondents mentioning	31	11	14	5	5
% (N=38)	82	29	37	14	14

Table 2: Major symptoms noticed before death of 15 donkeys by their owners

	Emaciation	*Vaginal prolapse*	*Ruffled hair coat*	*Colic*	*Bleeding*	*Hyena attack*	*None*
No. of respondents	9	3	3	2	1	1	3
% (N=15)	60	14	7	33	33	7	33

Figure 4. Seasonal occurrence of ecto-parasites of donkeys as suggested by respondents in Kaptanya sub-County.

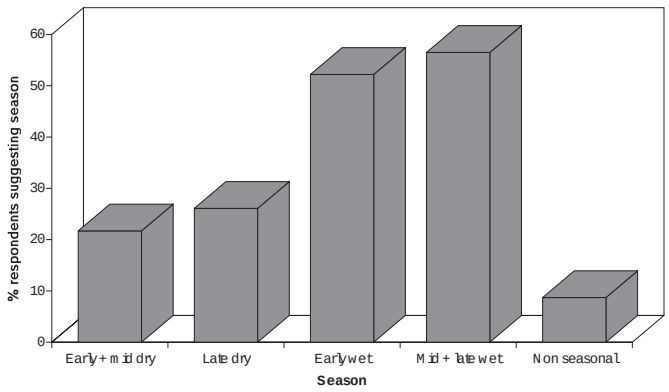


Figure 5. Seasonal occurrence of biting / nuisance flies in Kaptanya sub-County.

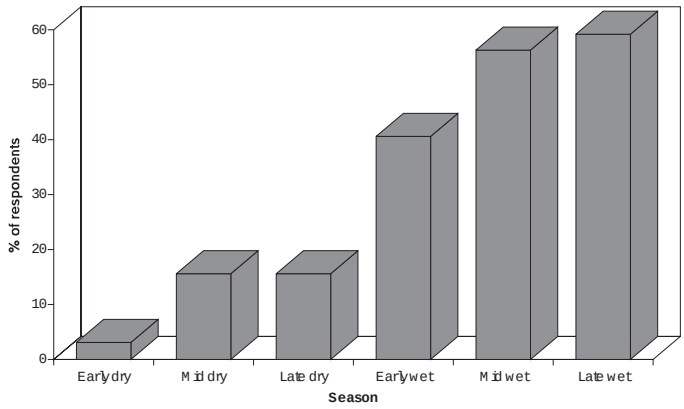
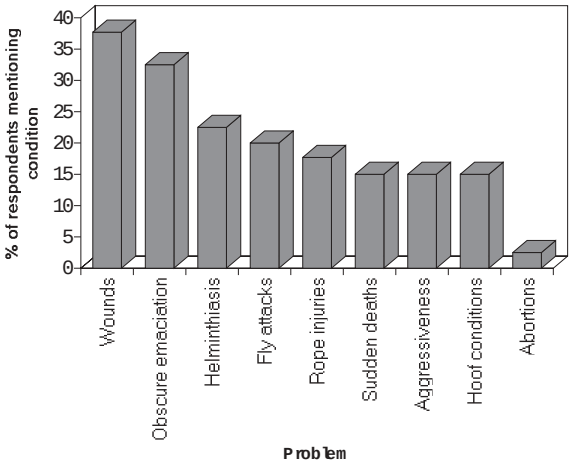


Figure 6. Percentage of donkey owners who reported problems associated with donkey usage in Kaptanya sub-County.



Locomotory system

Of the 40 respondents, 29 (73%) reported abnormalities in locomotion due to joint sprains and unknown causes. Four (10%) reported abnormalities in gait of their animals due to various degrees of hoof deformities.

Respiratory system

Eleven (28%) of the 40 donkey owners reported respiratory problems with varying degrees of coughing, sneezing and dyspnea.

Reproductive system

Ten (25%) of the 40 respondents reported abortion in their donkeys. Of the ten, five (50%) reported abortion in the second trimester, four (40%) reported it in the third trimester and one (10%) reported abortion to have occurred in the first trimester. Four (10%) of the 40 respondents reported dystocia.

Sensory system

Six (15%) respondents reported that they have had animals with neurological signs, manifested by the animal moving in circles. Two (5%) reported presence of eye worms.

Death of donkeys

Of the 40 respondents, 15 (37.5%) reported deaths of donkeys; a total of 22 donkeys were reported to have died. Of the 22 donkeys that died, four (18%) were very old, nine (41%) were adults, five (23%) were young adults, one (5%) was just weaned, three (14%) were not yet weaned. Table 2 lists the types and incidence of symptoms noticed by owners immediately prior to death of their animals. As shown in Figure 6, donkey owners reported various problems associated with use of their animals.

Discussion

This study showed that donkeys do fall ill. Diseases of donkeys were reported most

often in the wet season; this could have been associated with the high prevalence of biting flies and stress due to cool conditions in this season. The most affected age group were the young adults (two to three years old), probably due to lowered immunocompetence resulting from stress, since at this they are beginning to undergo training for load-carrying. The relatively high incidence of disease in the 3 to 10 year old donkeys could also be related to work.

The most common cause of death, according to owners, was helminth infestation. Svendsen (1990) has previously reported helminthiasis to be a leading cause of death in working donkeys. It was not surprising that helminthiasis was prevalent, since there was no treatment against helminths. Donkeys that were reported to have died of trypanosomiasis were found principally at lower altitudes, where tsetse flies are probably present. No trypanosome parasites were found in the donkeys examined in the present study of animals from upland regions. Donkeys that were said to have died of colic could have been exposed to and consumed large quantities of maize grain. Fatal colic could also have arisen from strongylid overload (Jordan, 1986). Donkeys that died following trauma could have acquired tetanus.

Reports for digestive disturbances were suggestive of helminthiasis (Khallaayoune, 1990). *Cyathostomum spp* ova were the helminth found most frequently in donkey faeces; this is in accord with a study carried out in warmer climates by Sewel (1990). Given the high prevalence of *Strongylus spp* infestation, the low incidence of reported cases of colic is surprising; probably most colic cases in the donkey are not frankly obvious (Jordan, 1986). *Parascaris equorum* infestation could probably explain the presence of small-sized donkeys in some areas (Khallaayoune, 1990). Many donkeys were infected with the protozoans of *Babesia spp*; however, no clinical cases were reported, suggesting the possibility of pre-immunity to babesiosis in these animals.

The mean value of the haemotocrit reading was slightly higher than that obtained by Hill (1989) in Zimbabwe; the range was also larger. The variation in haemotocrit may be due in part to the high altitude of Mount Elgon region where Kaptanya is found. It could also be due to differences in laboratory protocol, nutrition, and parasite burdens, Hill (1989).

The relative abundance of ecto-parasites (ticks, mites, and nuisance flies) was seasonal, with these parasites appearing during the rains. The high prevalence of biting flies during the wet season may be partly responsible for the high risk of disease as well as poor body and skin condition during this season. Ticks of the genus *Rhicephalus* and genus *Boophilus* were reported to infest donkeys. It is however difficult to observe tick infestation in donkeys. *Rhicephalus* and *Boophilus* ticks may transmit babesiosis.

A large proportion of donkeys suffered from various degrees of wounds and abrasions, similar to the situation reported by Rodriguez-Maldonado (1990) in Mexico. Wounds could have been due to poor harnessing. Abnormalities in locomotion incident to joint sprains and unknown causes suggested that donkeys were overloaded, leading to tendon damage. The reported hoof deformities could have resulted from lack of proper hoof trimming (Soliman, 1989).

We suggest that the main cause of abortion was stress from overwork of pregnant females; dehydration could also have contributed to stress and abortion. Less frequently mentioned as a cause of abortion was the mating of pregnant donkeys. The occurrence of dystocia was low.

Various degrees of coughing, sneezing and dyspnea were reported; these may have been symptoms of respiratory tract infections such as equine influenza, streptococcal infections, chronic obstructive pulmonary disease (COPD), rhinopneumonitis or verminous pneumonia (Fowler, 1986; Frape, 1986; Hifny, Mansour, Ibrahim and Taha, 1988; Jacobs, 1986; Rodriguez-Maldonado, 1990 and Merck, 1991). Reported problems affecting the head could have been related to viral encephalitis.

Many donkeys were emaciated at death; the loss of body condition could indicate excessive exertion of the working animals, coupled with helminth infestation. The latter is probably due to lack of any anthelmintic treatment along with repeated use of pastures heavily contaminated with

parasite eggs. Death in young donkeys (aged two to three years) may have followed the excessive work load occurring when these animals are in training.

Conclusions and recommendations

It has been shown that disease problems of donkeys do exist, parasitism being the major cause of ill health in donkeys. People are ignorant of the disease problems that affect their donkeys. Donkey owners, users, and veterinarians should be informed of these problems and learn to recognise and assess the state of well-being of the animals.

The donkey could be a very useful animal in most areas of Uganda as a domestic source of draft power, for example helping women to collect water and firewood, if its health and dietary requirements were met.

Basic data is lacking regarding numbers, physiology, disease incidence, and all aspects of management of Ugandan donkeys. Information on nutrition, disease control, and genetic improvement is especially scarce; thus research should be done in these areas.

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References

Fowler, J N, 1986**.** Medical. pp. 91-99 in: Svendsen E D (ed)*, The Professional Handbook of the Donkey*. 1st Ed. Sovereign Printing Group, England.

Frape D, 1986. Pests and ailments of horse and ponies related to diet, to stable design, and to grazing. p. 243 in: *Equine Nutrition and Feeding*. Longman Scientific and Technical group. U.K Ltd. Longman House, Burnt Mill Harlow Essex, CM20. 2JE, England.

Hifny A, Mansour A A, Ibrahim I A and Taha M, 1988. The relation of synovial bursae to the work of the donkey. *Assiut Veterinary Medical Journal* **20** (39): 9.

Hill, F W G, 1989. Heamatological and Clinical chemistry values for donkeys in Zimbabwe. *Veterinary Journal* 20, (3): 114.

Jacobs D E, 1986**.** Lungworm*, Dictyocaulus anfieldi*. in: *Colour Atlas of Equine Parasites*. Gower Medical Publishing. London. New York. pp. 8.7-8.9.

Jordan W J, 1986**.** Surgery. pp. 101-111 in: Svendsen E D (ed)*, The Professional Handbook of the Donkey*. 1st Ed. Sovereign Printing Group, England

Khalifa R, Monib M E and Mandour A M, 1988**.** A study of parasites infecting equines in Assiut Governorate. *Assiut Veterinary Medical Journal* **20** (40): 68.

Khallaayoune K, 1990**.** Benefit of strategic deworming programme in working donkeys in . pp. 174–180 in: Fielding D and Pearson R A (eds), *Donkeys Mules and Horses in Tropical Agricultural Developmen*t. Centre for Tropical Veterinary Medicine, University of Edinburgh, Edinburgh, UK. ISBN 0907146066.

Merck Veterinary Manual (7th Ed), 1991. Fraser C M(ed.), Merck & Co., Inc. Rahway, N J, USA.

Rodriguez-Maldonado G, 1990. The principle problems of working donkeys in Mexico. pp. 138–139 in: Fielding D and Pearson R A (eds), *Donkeys Mules and Horses in Tropical Agricultural Development*. Centre for Tropical Veterinary Medicine, University of Edinburgh, Edinburgh, UK. ISBN 0907146066.

Sewell M M H, 1990**.** Uniformity and contrast of helminth diseases in equids. pp. 141–150 in: Fielding D and Pearson R A (eds), *Donkeys Mules and Horses in Tropical Agricultural Development*. Centre for Tropical Veterinary Medicine, University of Edinburgh, Edinburgh, UK. ISBN 0907146066

Siefert, L, 1973**.** Handouts for students. Animal Health Research Centre, Entebbe, Uganda.

Soliman, I A, 1989**.** Clinical observations of hoof deformities in donkeys. *Assiut Veterinary Medical Journal* **21**: 163.

Svendsen, E D 1991. Work to improve conditions of donkeys and mules world-wide. p. 181–188. in: Fielding D and Pearson R A (eds), *Donkeys Mules and Horses in Tropical Agricultural Development*. Centre for Tropical Veterinary Medicine, University of Edinburgh, Edinburgh, U. K. ISBN 0907146066.

Woo P T K, 1970. The heamatocrit centrifugation technique for diagnosis of African trypanosomiasis. *Acta Trop*. **27**: 384–386.