

## Common Health Problems of the One Humped Camel (*Camelus dromedarius*) Introduced into Sub-Humid Climate in Zaria, Nigeria

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**Abstract:** The prevalence of common diseases of the one humped camel (*Camelus dromedarius*) introduced into a sub-humid savanna climate of Nigeria for a period of 3 years (2002-2005) is reported. A total of 85 clinical cases were examined. Sixty-seven and thirty-three percents were in the rainy season (June to October) and dry season (November to May), respectively. The most prevalent health problem was helminthosis (31.8%). Egg counts of up to 800 per gram of faeces (epg) were recorded during the rainy season. Traumatic injuries recorded 17.6%, tick infestation 10.6% and footpad perforation 8.2%. Others were conjunctivitis 5.9%, mange 4.7%, abscesses 4.7%, lameness 7.1%, enteritis 2.4%, abortion 2.4%, coccidiosis 2.4%, kneecap dislocation 1.2% and bent-neck syndrome 1.2%. Blood parasites observed were *Anaplasma marginale* and microfilaria. Two male camels died during the period of study, the first death being due to pneumogastroenteritis and the second of bent-neck syndrome. The disease conditions showed remarkable seasonal pattern of occurrence with higher prevalence during the rainy season. The undiagnosed cases of musculoskeletal incoordination needs further research for effective introduction of camels into sub humid zone of Nigeria.

**Key words:** Camelus dromedarius, diseases, sub-humid climate, Nigeria

### INTRODUCTION

The diseases of the camel generally have not been extensively researched into probably owing to the hostile environment in which the camel lives and the non-sedentary nature of the herds, constantly moving in search of grazing and water (Köhler, 1994; Mukasa-Mugerwa, 1981). Despite the general reputation for hardiness and resilience, camels are however, vulnerable to many infections (Wernery *et al.*, 2004) and parasitic agents, physical stress and occupational injuries (Agab and Abbasid, 1999; Chemuliti *et al.*, 2003; Bukachi *et al.*, 2003).

The signs of ill health in camel may be masked because of the normal variations in physiological functions (Wilson, 1984; Tefera, 2004) but specific disease or parasite related symptoms are generally easy to recognise (Higgins, 1986). A wide range of parasitic, infectious and work related diseases is found in camels. Few deaths are attributed directly to parasites but are undoubtedly a major cause of economic loss (Chemuliti *et al.*, 2003; Wilson, 1988). This study was carried out to determine some diseases and health problems affecting camels introduced into a sub humid savanna environment.

### MATERIALS AND METHODS

**Study area:** This study was carried out at the National Animal Production Research Institute, Ahmadu Bello University, Shika-Zaria, Nigeria located on latitude 11°12'N, longitude 7°33'E and on altitude of 610 metres above sea level. Shika is within the northern guinea savanna zone and has a sub-humid tropical climate.

**Baseline clinical screening of the camels:** A general clinical examination of the camels on their first arrival from Mai Adua International Livestock Market at the Niger-Nigeria border in northern Katsina State into the National Animal Production Research Institute, Ahmadu Bello University, Shika-Zaria was conducted in a standard cattle crush and also in a crouching position. All clinical abnormalities found were recorded accordingly. All the camels were clinically examined and screened for haemoparasites, gastrointestinal parasites and ectoparasites. Samples of blood, faeces, skin scrapings and ectoparasites were taken from all camels and processed and identified in the appropriate laboratories.

**Data collection:** All camels were individually inspected twice a week for signs of any ailments and the grazers'

account of observed ill health and its symptoms were obtained. Clinical examination and diagnoses were made on each sick animal and samples were collected for further investigation and confirmation of the tentative clinical diagnoses wherever possible.

**Blood samplings:** Five millilitres of blood sample were collected from each camel through jugular venipuncture into bijou bottles containing disodium salt of Ethylene Thiamine Tetraacetic Acid (EDTA) as anti-coagulant for haemoparasitological analysis on their arrival on-station. Routine bleedings were done and also on occasions when need for such became critical. Samples were usually transported to the laboratory in ice pack. Bleedings were done either in the grazing fields with the camel properly restrained in a crouching position or in a standard cattle crush.

**Faecal samplings:** Faecal samples were obtained rectally by inserting hand into new set of polythene bags, scooping the rectal faeces, withdrawing the hand and inverting and tying the bag to prevent direct contact with the faeces. The collected faeces were sent to Helminthology laboratory for gastrointestinal parasites determination.

**Skin scrapings:** Skin scrapings were obtained using a clean blade and sent to Entomology laboratory for analysis and identification.

**Statistical analysis:** Rates of disease prevalence, morbidity and mortality were calculated by conventional procedures (Schwabe *et al.*, 1977). Seasonal distribution of the encountered diseases as well as parasitic load (faecal egg counts) were analyzed for differences by the chi-square test.

## RESULTS

A total of 85 camel clinical cases were attended to within 84 months in National Animal Production Research Institute, Shika, Zaria. Sixty seven per cent (67.05%) of the cases were handled during the rainy season months of June to October, while 32.94% were during the dry season months of November to May (Table 1). The numbers and percentages of different cases are shown in Table 2.

The haemoparasites, gastrointestinal parasites and ectoparasites obtained during the general screening of camels on arrival into the Institute were *Microfilaria* (++) Strongyle eggs (epg 60) Strongylus eggs (epg 280) *Trichuris* eggs (epg 100) and few *Hyaloma dromedarii* ticks.

Helminthosis was the most prevalent health problem with 27 (31.76%) cases. This condition was clinically manifested by the consumption of large amounts of sand (pica) particularly anthills (Fig. 1). The faecal egg counts of nematodes are shown in Table 3. Egg counts of up to 800 per gram of faeces (epg) were recorded. Traumatic injuries followed with 15 (17.64%) cases, tick infestation

Table 1: Disease conditions of the one humped camel (*Camelus dromedarius*) encountered in NAPRI Shika-Zaria, Nigeria

Conditions	No of cases	Prevalence rate (%)
Helminthosis	27	31.76
Traumatic injuries	15	17.64
Tick infestation	9	10.58
Foot pad perforation	7	8.23
Conjunctivitis	5	5.88
Mange	4	4.70
Abscesses	4	4.70
Lameness	6	7.05
Enteritis	2	2.35
Abortion	2	2.35
Undiagnosed/unknown	2	2.35
Knee cap dislocation	1	1.17
Bent-neck syndrome	1	1.17
Total	85	

Table 2: Monthly distribution of the disease conditions of the one humped camel (*Camelus dromedarius*) encountered in NAPRI Shika- Zaria, Nigeria

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	Total	(%)
Jan	3	3												6	7.05
Feb		2									1			3	3.52
Mar		1	1									1		3	3.52
Apr	1	1												2	2.35
May	1		3											4	4.70
Jun			2		1		1	1						5	5.88
Jul	8	1	2		1					1				13	15.29
Aug	5	1		7						1				14	16.47
Sep	3					1	2	3	1				1	11	12.94
Oct	3	5			1	3		2						14	16.47
Nov	2	1			2				1		1			7	8.23
Dec	1		1				1							3	3.52
Total	27	15	9	7	5	4	4	6	2	2	2	1	1	85	

1 = Helminths 2 = Traumatic injuries 3 = Tick infestation 4 = Footpad perforation 5 = Conjunctivitis 6 = Mange 7 = Abscess 8 = Lameness 9 = Enteritis 10 = Abortion 11 = Undiagnosed cases 12 = Knee cap dislocation 13 = Bent-neck syndrome

9 (10.58%) and footpad perforation 7 (8.23%). Others were conjunctivitis 5 (5.88%) mange 4 (4.70%) abscesses 4 (4.70%) lameness 6 (7.05%) enteritis 2(2.35%) abortion 2(2.35%) undiagnosed/unknown conditions 2(2.35%) kneecap dislocation 1 (1.17%) and bent-neck syndrome 1 (1.17%). Two male camels died during the period of study, the first from pneumogastroenteritis and the second one of bent-neck syndrome.

### DISCUSSION

Helminthosis, the most prevalent clinical condition in this study is a well-recognized problem in free-ranging camels. Previous studies indicated that 70-80% of pastoral camels in the arid zone were infected with one or more helminth parasites. Mixed infections with *Haemonchus* sp. *Trichuris* sp. *Cooperia* sp. and *Trichostrongylus* sp. are most common (El Amin *et al.*, 1984). In the present study, while the infection rate was almost constant throughout the year, camels infected during the dry season sustained a heavier parasite load during the rainy season (31.76%) with the most consistent sign of sand eating (Fig. 1; Arzoun *et al.*, 1984a). Early rains is apparently the period when the developmental stages of nematodes resume, this coincides with the time of nutritional stress, as pastures are still sparse and animals not yet in their good body condition. No liver flukes were however diagnosed in this study. In

an effort to reduce the helminth load, a control programme was set up in which camels were given therapeutic doses of broad-spectrum anthelmintic (Albenda<sup>®</sup> bolus\* at 5 mg per kg body weight) monthly during the rainy season.

Traumatic injuries were the second most common disease condition (17.64%) recorded, with peak incidence during the raining season. Barbed wire lacerations, pecking birds and browsing in thorny bushes were responsible for the seasonal prevalence of the recorded injuries in this study.

Close contact and gathering of camels in the dry season, particularly at watering points, could be responsible for increased exposure to and subsequent spread of mange infestation during the rains. The lower

Table 3: Types of endo and ectoparasites seen in the one humped camel (*Camelus dromedarius*) in Shika Zana, Nigeria

Parasite	Frequency of occurrence	(%)
Strongyle	11	25.58
Trichuris	4	9.30
Strongylus	6	13.95
Moniezia	3	6.97
Coccidia	2	4.65
Anaplocephala	1	2.32
Hyaloma dromedarii	1	2.32
<i>Hyaloma</i> sp.	2	4.65
<i>Rhipicephalus</i> sp.	3	6.97
<i>Amblyoma</i> sp.	3	6.97
Sarcoptic mange	4	9.30
Microfilaria	1	2.32
<i>Anaplasma marginale</i>	2	4.65



Fig. 1: Evidence of sand eating on the gum (arrowed)

prevalence of mange during the dry season in this study could be due to the high ambient temperature possibly leading to reduction in the activity of mite (Higgins, 1985; Kumar *et al.*, 1992).

Abscesses of the inferior cervical lymph nodes were due to *Corynebacterium pyogenes* and *Staphylococcus aureus*. The causative agents of abortion were not established despite the swabs taken for microbiological identification. Conjunctivitis resulted from traumatic injuries by thorny trees and from ticks attached to the eyelids.

Lameness or locomotory disturbances recorded were mainly due to traumatic injuries of the footpads caused by thorns and joint lesions. The bent-neck syndrome recorded is a condition of unknown aetiology. The affected camel was physically healthy in the morning but was later found terminally recumbent in the afternoon with a bent neck. It is a disease, which usually terminates fatally owing to the inability of the affected animal to extend its neck to graze. In an attempt to isolate the specific aetiological agent of bent-neck, Agab and Abbas (1999) investigated the following parameters: Aspartate Aminotransferase (ASAT), Sorbitol Dehydrogenase (SDH) and total proteins in the affected animals but no abnormalities were detected. Plant poisoning by *Capparis tomentosa* was however incriminated as the primary cause of the condition in a study by Idris *et al.* (1979). Also another condition of unknown aetiology manifested by musculoskeletal incoordination of the forelimbs and ataxia was encountered. Predisposing factors to this condition are not identified (Corbera *et al.*, 2003). The laboratory samples taken in this case were negative. No clinical improvement following anti-inflammatory and antibiotic therapy was observed.

Tick infestations were observed during the rainy season on the camels. *Hyalomma dromedarii*, a camel specific tick was picked on the camels' arrival in the Institute. This species is apparently associated with outbreaks of camel pasteurellosis (Wilson, 1998). Other ticks picked in the course of the camels stay were *Amblyoma* and *Rhipicephalus* sp. Camels however, do not suffer greatly from tick borne diseases but the physical irritation and the wounds caused by ticks may allow entry of other disease organisms (secondary bacteria infection) and blood loss from heavy infestations can cause anaemia, especially in young calves (Higgins, 1985; Mahran and Saleh, 2004; Zeleke and Bekele, 2004.). The introduction of the camels to improved management system however, goes with some health problems of intensification (Mukhtar, 1971).

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