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# THE ONE-HUMPED CAMEL IN UGANDA

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## ABSTRACT

This paper provides the first comprehensive account of the presence of camels and of camel production in Uganda. Uganda is a poor East African landlocked country. Agriculture's contribution to GDP has shrunk by 23.5 per cent in the last 30 years whilst that of the service sector has increased. Commercial and food crops are the major subsectors of agriculture but livestock add almost 10 per cent to agricultural GDP. Goats are numerically the most important quadruped livestock, followed by cattle, sheep, pigs and donkeys: there are very few horses. The one-humped camel is not part of the traditional array of domestic livestock but the species started to appear in the arid northeast of the country during the 1960s/1970s. In 2008 the national camel population was about 31 000 but in 2017 may be as high as or more than 40 000. Traditional pastoral tribes have become camel keepers for the production of milk, some meat, some transport and for medical uses. Internal parasites and trypanosomes are a problem for camel health and welfare. Feed supplies in the area of camel keeping comprise many of the camel's preferred browse species. Although not a traditional species and few in number camels have the potential to contribute to food security and to the livelihoods of pastoralists in some of the remote parts of Uganda.

**Key words:** Animal diseases, feed resources, introductions, livestock ownership, livestock products

The Republic of Uganda is a landlocked country in East Africa. It is bordered to the east by Kenya, to the north by South Sudan, to the west by the Democratic Republic of the Congo, to the south-west by Rwanda and to the south by Tanzania. The country lies on the East African Plateau between latitudes 4°N and 2°S and longitudes 29°E and 35°E. The average altitude is about 1,100 metres (3,609 ft) above sea level. Uganda has an area of 236 040 km$^2$ – of which a rather large proportion comprises several lakes – and was home to 34.9 million people in 2014. For administrative purposes Uganda is divided into regions, sub-regions, districts, counties, sub-counties and parishes. The country is classified in international systems as being of low income with a Gross Domestic Product (GDP) per person per year of USD 672 in 2015 (CIA, 2016; UNSD, 2016; Nakayima *et al,* 2016).

Favourable soil conditions, good rainfall over much of the country and temperatures moderated by altitude allow continuous cultivation of perennial crops in the south and annual cropping of mainly subsistence crops in the north. The driest northeastern corner of the country supports only pastoralism. Agricultural products account for nearly all of Uganda's foreign exchange earnings and coffee alone accounts for about 25 per cent of the country's exports. Coffee, cotton and tea are the main commercial crops. Maize, plantains/bananas, cassava, beans, groundnuts, sweet potatoes, sorghum and millet are the main food crops in terms of area but plantains/bananas and cassava provide more than half of total food production. In 1980 agriculture contributed 70 per cent of the country's Gross Domestic Product but this declined to 23 per cent in 2011 as the service sector expanded to contribute 51 per cent of GDP (ADB, 2014). Agriculture, nonetheless, provided direct employment to 8.8 million people equivalent to 66 per cent of the national work force in 2011 and in total 19.3 million persons in 3.95 million households were directly supported by agriculture (MAAIF, 2011). The number of households owning livestock in 2008 was 4.5 million, this figure exceeding the number of "agricultural households" as many landless and urban people keep some livestock (MAAIF, 2009). Livestock contributed 9.1 per cent of total agricultural GDP or about 1.7 per cent of total GDP in 2011. Livestock numbers in 2008 were estimated at 12.45 million goats, 11.4 million cattle, 3.4 million sheep, 3.2 million pigs, 0.15 million donkeys, 32 870 camels and 1 590 horses: in addition there were 27.4 million poultry (MAAIF, 2009).

This paper is the first comprehensive account of camels and camel production in Uganda.

### History of introductions

The only record of camels in Uganda in historical accounts is that of three baggage animals

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used by Lieutenant R. G. T. Bright in 1898 in an expedition from Uganda to Abyssinia (now Ethiopia) (Sharf, 2005). Nothing is known of the provenance of these camels nor of their subsequent fate. In more recent times the Ministry of Agriculture, Animal Industries and Fisheries has not been able to provide information on the dates that camels were introduced to Uganda (Ministry Official to Jesca Nakayima, Pers. Comm.). Anecdotal evidence from pastoralists indicates, however, a likely date in the late 1960s or early 1970s when members of the Pokot tribe living in Kenya brought in animals when visiting Pokot relatives in Uganda. The Matheniko tribal community obtained camels from Uganda Pokot and also from Turkana pastoralists who crossed from Kenya to Uganda particularly during drought periods.

The Ugandan president did not receive – or perhaps refused to accept – camels from the late President Gaddafi of Libya, in contradistinction to many of his peers in other African countries (Wilson, 2013; 2014).

**Numbers, distribution and ownership**

In 2008 there was an estimated 32 870 camels in Uganda (MAAIF, 2009). This number may have increased to over 41 000 in 2017. It needs to be realized, however, that cross-border movements mean that numbers are likely to be in a constant state of flux.

In 2008 Karamoja sub-region in northeastern Uganda (Fig 1) had the highest estimated number of camels at 32 030, equivalent to 97.4 per cent of all Uganda's camels: the sub-region was also home to 91.3 per cent of all national donkeys, 60.4 per cent of horses, 20.0 per cent of cattle and 16.3 per cent of goats. Within Karamoja, Nakapiripirit and Moroto were the districts with the most camels (MAAIF, 2009).[1] The climate in Karamoja is generally harsh with high rainfall variability and high evapotranspiration. Rainfall has historically been in the range 350-1000 mm per annum, with the lower end of the spectrum in the east. Precipitation is usually sporadic and falls in one rainy season. The main problem with the rainfall is its distribution rather than the total amount. The intensity and the variability, particularly the existence of sporadic intense wet periods followed by drought events, have always had debilitating impacts on the area (Egeru *et al,* 2014a). Daily temperatures exceed 30° C for most of the year and are often in excess of 40° C. Over the long term total rainfall has declined and temperatures have increased (Egeru *et al,* 2014b). In short, the local environment is more propitious to the camel than it is to other species of domestic livestock.

Tribal groups that own camels are Pokot (also known as Suk) in Amudat district and Matheniko in Moroto district, especially in Katikekile and Tapac sub-counties. The Pokot are only distantly related to the dominant ethnic Karamojong and are the most pastoral section of the Kalenjin cultural group. The Pokot extend across the border into Kenya where camels have been reared for much longer. The Kenya Pokot became camel herders via interactions with traditional camel-owning tribes such as the Samburu who inhabit a much drier part of Kenya. Interactions between the Pokot subgroups of Uganda and of Kenya led to the introduction of camels to Uganda.

The average herd size in Karamoja is 11.3 head with a median of 7.5 head, the lower median suggesting that there are some very large herds. Some herds do indeed comprise 30 to 50 camels (Nampala, 2013). Herds are slightly smaller in other areas (MAAIF, 2009). For grazing purposes the herds of several owners may be combined and herded together.

**Products**

The traditional pastoralist mode of production is not one of commodities as it not primarily aimed at producing for the market. The standard outputs of milk and meat are mainly for home consumption. Herd accumulation is a vital economic function not only for cash but for traditional values in the context of the extended family (being able to loan out animals), as bride price and for prestige within the community. Camel owners therefore tend to be asset rich – adult animals when sold may make 3.5 million Uganda shillings (almost 1000 US dollars) whereas a cow is worth 1.1 million Uganda shillings (300 US dollars) – whilst remaining cash poor.

Mature camels weigh up to 600 kg. Sexual maturity is achieved at 3-4 years and calves are then born at 18-month intervals. Camels may live for up to 30 years. Percentage mortality is much less than in other classes of domestic stock.

The camel value chain includes milk, meat, hides, transport and medicines. Most production is for home consumption but there is limited commercial trade in milk and meat. Milking is done

1. Nakapiripirit District has now had its eastern part excised to form Amudat District and this area, bordering on Kenya, now has the greatest number of camels.

by hand direct into containers (most often plastic) by both men and women who, because of the size of the camel, are able to stand during the process (Fig 2). Camel calves are given access to their dams to start the let-down process. Some milk is sold outside the immediate and extended family and is collected by traders in 25-litre metal containers (Fig 2). In times of plenty surplus milk is transformed to butter, which has a longer storage life than milk; this value-added product is destined for home consumption or for sale on the local market (Fig 2). Local herders claim that they milk lactating camels up to five times daily and obtain as much as 5 litres per milking.

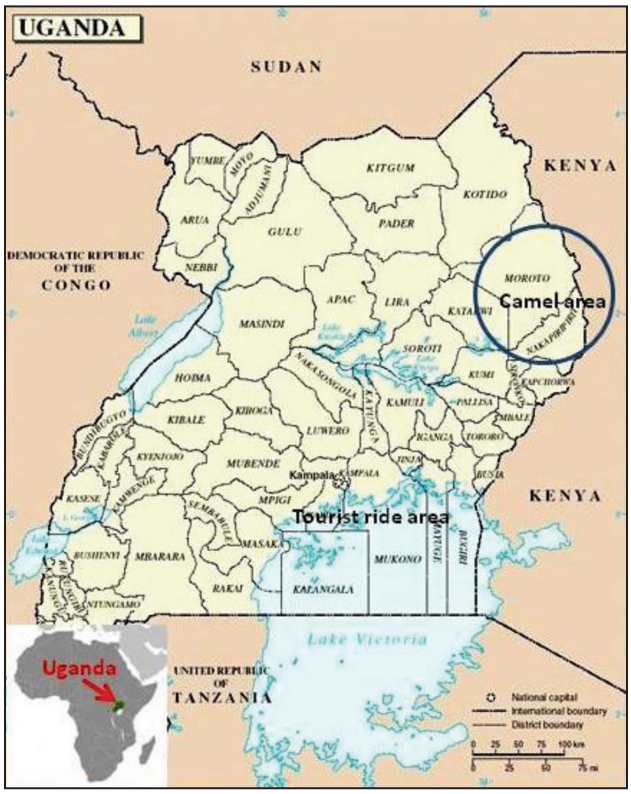


**Fig 1.** Area of camel herding in northeast Uganda and principal area where camels are used for tourist rides.

Most slaughtering for meat is done at the home site but occasionally an animal is sent to an abattoir. In addition to home consumption, there is an active trade in camel meat, mainly via traders of Somali origin who buy from camel owners and transport meat to the main urban areas (Fig 3). On the Kampala retail market 1 kg of camel meat is sold for 17 000 Uganda shillings (4.72 US dollars) compared to 13 000 Uganda shillings (3.6 US dollars) for beef. A recently opened camel abattoir in Kampala is testament to the development and increasing recognition of camel meat as a desirable product in the diet of the urban population.

Camels are not normally hired out to other parties by the owners for transport or agricultural purposes. They are, however, used as transport animals by the owners when the camp is moved. The use of camels for leisure as a riding animal has become increasingly popular especially in urban areas and at tourist hotels on the shores of Lake Victoria around Entebbe and other resort areas (Fig 4). Camels are also being exhibited at local carnivals and other festivities as an attraction.

In addition to providing more conventional products, the urine of this mammal is considered by some people as important in curing certain diseases, including HIV/AIDS. According to Idriss Shaban, a camel urine seller "This urine, you use three times every day, in the morning, noon and night. If symptoms persist, you must use it for four months without missing using same prescription. You then visit a doctor. If you still feel pain in that month, don't worry it will vanish." The World

**Fig 2.** Pokot woman assisted by her daughter milking a camel, milk being bought by a trader and butter as a value-added product for sale.

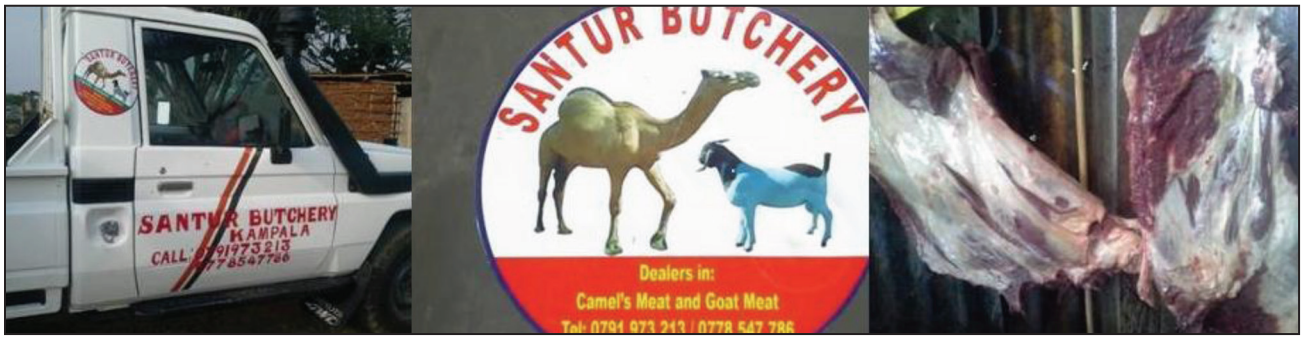


**Fig 3.** Meat trader's pick-up truck and logo and undifferentiated camel meat for retail sale.

**Fig 4.** Camel being ridden as a leisure activity

Health Organisation has urged people to refrain from drinking camel urine. It says the urine has been proven to cause the Middle East Respiratory Syndrome, a viral respiratory disease which can prove fatal. Desperate patients, however, are willing to take the risk in order to be healed. The Ugandan government has made no follow up concerning the health benefits of camel urine and will only take action if it is scientifically proven as a cure. In the meantime it remains a hope for many who overlook the risks (Africa News, 2016).

## Welfare and disease

The generally good body condition of most camels and the presence of many calves and young stock in the herds are indicative of no major welfare problems (Fig 5).

Mange (referred to locally as 'emitina') is seen by the owners as the major camel health problem. A recent study involving 82 camels from Moroto and Amudat Districts was the first in Uganda to establish the parasitic worm burdens of camels. It was found that 48 camels (58.5 per cent) were infected with Strongyle eggs at a level of 1056 eggs per gram of faeces. Cestodes of the family Anoplocephalidae were found in 15 camels (18.3 per cent). The lungworm *Dictyocaulus cameli* was recorded in 24 camels (29.3 per cent) but at a very low level of infection of 1 worm per case. The coccidian *Eimeria cameli* was found in 9 camels (11.0 per cent) with a mean count of 34. Infections with one parasite species were found in 22 camels (26.8 per cent), with two parasite species in 24 camels (29.3 per cent) and with three species in 7 camels (8.5 per cent) (Nakayima *et al,* 2017).

A sample of 112 camels from Moroto District was examined for *Trypanosoma evansi* infection. The Micro Haematocrit Centrifuge (MHCT) technique was used for parasite diagnosis. Suratex® was used to detect the presence of trypanosome antigens and Enzyme-Linked Immuosorbent Assay (ELISA) was used to detect anti-trypanosomal antibodies. Parasite prevalence ranged from 0 per cent to 47 per cent in camels from three different herds, Suratex® showed positivity in the range 35-65 per cent and ELISA high antibody presence. Low haematocrit values were associated with presence of parasites and antigen-positive animals. This is the first report of *T. evansi* infection in camels in Uganda and shows that camels could be of consequence in the epidemiology of the parasite in the country (Olahu-Mukani *et al,* 1998).

## Feed resources

Camel feed resources derive from four major vegetation communities: woodland; bushland; grassland; and, farmland. There is great species diversity in woodlands and bushlands, moderate diversity in grasslands and little diversity in the farmlands (Salamula *et al,* 2016). Camels are predominantly browsers and because of their size are able to procure feed from heights of up to 4 metres above the ground on resources that are not available to other domestic stock. They are, however, eclectic in their tastes and feed on a broad spectrum of fodder plants that includes thorny trees and shrubs, halophytes and aromatic species that

**Fig 5.** Mixed age groups of camels in night compounds constructed of thorn bushes.

**Fig 6.** Typical wet and dry season feed conditions for camels in Karamoja sub-region.

may be avoided by other domestic herbivores. At times, nonetheless, they compete with these latter for other types of feed including grasses and herbaceous legumes. Camels employ various feeding strategies in Karamoja, depending on the season and the available resources, using the herbaceous layer of mainly annual species in the shorter rainy season and the browse layer of perennial plants in the longer dry season (Fig 6).

In a recent study the commonest browse species recorded were *Acacia brevispica, A. nilotica, A. senegal, A. seyal, A. tortilis, A. sieberiana, Balanites aegyptiaca, Opuntia cochenillifera, Commiphora africana, Dicrostachys cinerea, Euphorbia candelabrum, Grewia mollis, Maytenus undata, Rhus natalensis, R. vulgaris, Terminalia brownii, Zanthoxylum chalybeum* and *Lannea* sp. (Salamula *et al,* 2016). Discussions with camel herders allowed the identification of preferred species (Table 1), some of which such as Euphorbiaceae and *Tribulus terrestris* were rather surprising.

## Discussion

Pastoralists such as the Pokot and Matheniko have battled for centuries with adverse weather conditions and have often been more successful in adapting to changing situations than sedentary populations as they can be much more flexible in the face of changing conditions. There has, however, been widespread environmental damage from deforestation and overgrazing in recent times. Some of this damage results from increases in both human and animal populations that themselves derive from better medical care and reduced mortality. The addition of camels to the traditional domestic livestock array of the peoples of Karamoja sub-region is a logical strategy to reduce risk.

Camels have become an important part of the livelihoods of the Pokot and Matheniko but their presence in Uganda has gone largely unnoticed. Their numbers are not insignificant and they have been present for at least 50 years but the international

**Table 1.** Plant species indicated by local herders as preferred camel fodder in Karamoja sub-region.

| Vernacular (Pokot) name | *Scientific name* |
|---|---|
| Esuguru | *Tribulus terrestris* |
| Eligoi/Ekilala | *Euphorbia tirucalli* |
| Ekorete | *Balanites aegyptiaca* |
| Echogorom | *Capparis* sp. |
| Edapal | *Opuntia cochenillifera* |
| Emekui | *Baleria acanthoides* |
| Erereng | *Cadaba farinosa* |
| Ekadeluae | *Capparis tomentosa* |
| Ekodiokodioi | *Acacia senegal* |
| Eregai | *A. mellifera* |
| Eminit | *A. tortillis* |
| Ekapelimen | *A. nilotica* |
| Amugit | *Lagenaria siceraria* |
| Ekaleruk | *Cucumis* sp. |
| Etopojo | *Lannea discolor* |
| Ekadeli | *Commiphora africana* |

Source: Salamula *et al,* 2016

organisation charged with enumerating the world's livestock by country and species has no mention of them in its data base (FAO, 2014).

The camel lungworm *Dictyocaulus cameli* is a valid taxon but has rarely been recorded. It has been found in Iran (Ebrahimi *et al*, 2012) but the report of its presence in Uganda in this paper appears to be a first for Africa. Other diseases will certainly be found in Uganda camels in the future. For example, mastitis caused by a variety of organisms including *Staphylococcus aureus, S. epidermis, Escherichia coli, Streptococcus agalactiae* and species of *Micrococcus* and *Pseudomonas* has recently been recorded from West Pokot County in Kenya which neighbours on Nakapiripirit, Moroto and Amudat Districts (Toroitich *et al*, 2017). It is inconceivable that these organisms are not present in Uganda camels in view of the frequent interchanges across the national boundary.

Camels are better adapted to survival in areas with harsh climatic conditions than "conventional" domestic livestock species. As such the species has the potential to support the livelihoods and improve the resilience of the pastoral communities of the Karamoja sub-region and are likely to be an extremely important source of food and of improved welfare for local pastoralists.


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