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Donkeys: A Neglected and Underutilised Genetic Resource in Botswana

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Abstract: **Donkeys in Botswana are mainly used for draught power and very few people eat their meat and drink their milk. The aim of this paper was to review population, uses, health and management of donkeys in Botswana. Furthermore, alternative uses that should be explored to promote and make donkeys of more socio-economic importance to the resource poor farmers in the country are discussed. Donkey population has been increasing although there were some fluctuations in other years. It stood at 493 000 in 2003 and it was 310 000 in 2013. The donkeys are mainly used for draught power, namely: ploughing, cart pulling to transport fire wood, crop harvests and water in cattle posts. They are not a source of direct income. Donkeys do not easily succumb to diseases and parasites, therefore, most farmers are ignorant of diseases affecting donkeys in Botswana. The management of donkeys in Botswana is mainly characterised by limited supplementary feeding, poor housing and lack of veterinary care. The donkey industry could be promoted to contribute to food security and national economy through dairy farming, meat and hides exports to other countries. Such promotion could increase the value of donkeys in Botswana.**

Keywords: **Key word: Botswana, donkey, draft power, management, meat, milk, uses.**

I. INTRODUCTION

Donkeys are one of the species that constitute a significant portion of the livestock sector in Botswana. The donkey population increased from 142 000 in 1986 to 404 000 in 1997. However, there were some years when the population was fluctuating and the largest population reached was 493 000 in 2003. The population kept on fluctuating and in 2013 it stood at 310 000 and was the fourth largest after cattle, goats and chickens [15]. Despite their increasing population, donkeys have been marginalised and are considered to be of low-economic status and are mostly kept by people who are considered as poor. Previous studies indicated that most donkey keepers are males with a primary level education [17].

Donkeys in Botswana are mainly used for draught power (cart pulling, ploughing), riding and very few people eat their meat and drink their milk [18]. Donkeys are less valued by most farmers than other species such as cattle, goats, sheep and chickens. This might be attributed to the fact that donkey meat is not eaten by most people, and that there is no reliable market for donkeys in Botswana, making them to have little sale value compared to the above mentioned farm animals.

The extent of using donkeys for draught power may decrease due to the increasing use of mechanized machines in activities in which donkeys are used such as ploughing, fetching water and collection of fire wood. It is necessary to find ways of utilising this genetic resource because the increasing population means that the donkeys are competing with other species for grazing but yet the community does not directly benefit much from them economically. This paper discusses population trends, uses and management of donkeys in Botswana. Furthermore, alternative uses that should be explored to promote and make donkeys of more socio-economic importance to the resource poor farmers are discussed.

II. DISCUSSION

Donkey population trend:

The regression analysis of donkey population from 1979 to 2013 [15] shows that on average donkey population increases by 8749 per year. This is a substantial increase. The average population means of donkeys over the above mentioned period was 273 097 ±20767. The ratio of donkey to horse was about 17:1 [15]

Donkey management:

Feeding:

Donkeys are rarely provided with rationed feed, they mostly fend for themselves by grazing even during ploughing season when they are used to pull the plough. The ploughing season is the busiest time for donkeys, during which a rationed feed should be supplied. However, the animals cope without rationed feed, this indicate the adaptability and hardiness of this species. Few farmers that give supplementary feeds to their donkeys they mostly give roughages, a small percentage (7%) give concentrate supplements [17]. This is consistent with [10] who reported that in Pakistan donkey farmers do not care about feeding donkeys. Report of few farmers providing supplementary feeds to donkeys in Botswana [17] is contrary to Pearson's report [19] that indicated that farmers give donkeys supplements during dry season. [21] also indicated that farmers in Tanzania supplemented their donkeys with energy and protein rich feeds after harvest period during which donkeys do heavy work. This is an important practice which should be encouraged in all areas where donkeys are used for heavy jobs. However, there is no information on whether feeding supplements lead to increased work output or not.

Most farmers in Botswana provide water to donkeys once in a day [17]. The frequency of giving donkeys water practised in Botswana may not have effect on the efficiency of donkeys as [16] reported that feed intake of donkeys deprived water for 36 hours is not much affected.

Housing:

Most farmers build kraals for their donkeys in Botswana, these kraals do not have roofed shelters where the donkeys can be protected from rain. Furthermore, the donkeys are only kraaled at night during the ploughing season or when they have to be used the following day [17]. Poor housing system for donkeys was also reported in countries such as Pakistan [10]. This shows that donkeys are hardy animals, and thus they can do well even if they are housed in cheap kraals. It may also suggest that it is cheap to keep donkeys as no sophisticated housing is required.

Disease control:

Donkeys seem to be either resistant or tolerant to several diseases and parasites compared to other farm animals. This is suggested by the fact that majority of donkey farmers in Bobonong, Botswana do not know diseases that affect donkeys [17]. Therefore, there are no health control programmes put in place by donkey farmers in Botswana. This donkey characteristic may be the cause of increasing donkey numbers, despite the fact that very minimal veterinary services are provided to donkeys. It is believed that donkeys do not become sick, however, this believe is considered just a myth. The farmers may be misled by the fact that even the researchers have not taken much effort to study donkey diseases in Botswana.

In contrast to the Botswana situation, in Tanzania, farmers experienced several health problems in their donkeys [21]. In South Africa donkeys were found to be infested with helminth parasites [12], [13]. This implies that donkeys are infested by parasites, but they have resilience and tolerance mechanisms that enable them not to show any signs of sickness even if they are infested.

Uses of donkeys:

Donkeys in Botswana are used mainly for ploughing and transport [17]. The use of donkeys for transport is reported from long time ago in various countries. In Botswana the use of donkeys for transport is mainly for pulling the cart while few people ride them, especially at the cattle posts. The use of donkeys for pulling carts to transport goods is also common in South Africa [7].

The use of donkeys as ploughing animals has really enabled poor farmers who could not buy ploughing oxen to plough their field crops. The government of Botswana came up with programmes such as Arable Land Development Programme (ALDEP) that aimed at improving food security in resource poor farmers through improved crop production [25]. In

ALDEP, resource poor farmers were assisted to buy donkeys as draught animals and other ploughing implements that were pulled by donkeys. The farmers were paying 20-30% (depending on the gender of the farmer) of the cost of the packages while the government paid the rest. Even in this era of mechanisation and reduced use of oxen, donkeys are still used by the resource poor farmers. Similarly to Botswana, in Tanzania using donkeys for ploughing is ranked high after pack animals [21]. However, in Botswana it is not common to use a donkey as a pack animal. Transporting goods such as firewood, water, field crops harvests and building materials is done by donkey pulled cart, not putting the goods directly on donkey backs.

Donkey meat is eaten in some parts of the country. The consumption of donkey meat is restricted to a certain extent by religion, but apart from religion, it seems people are ashamed to be associated with eating donkey meat. [17] reported that only 15% of people ate donkey meat in Bobonong village in central district of Botswana. [4] reported that farmers sell their donkeys for meat consumption when they are exhausted and can no longer provide draught power. This suggests that meat at that time is not tender. Even so, it is not surprising that farmers only sell their donkeys when they are old because their main reason for keeping donkeys is for draught power and the meat is considered a secondary product. However, donkey meat has been reported to be of high quality with crude protein content of more than 50% on dry matter basis [1]. This protein content is more than double the protein content value of beef and mutton reported by [23]. However, [8] reported protein content value of donkey meat in disagreement with [1]'s findings. The protein content value reported by [8] is not far from the protein content value of beef. Notwithstanding the contradicting literature on protein content value of donkey meat, both studies show that the donkey meat is good enough to be a source of protein in human nutrition. The availability of organised donkey meat markets may lead to more people consuming donkey meat.

Donkey marketing:

Most donkey farmers in Botswana do not sell their donkeys and those who sell they sell them to other farmers. This may be the reason for increasing donkey numbers in Botswana. There is no reliable market for donkeys in Botswana. The lower selling price per donkey might also contribute to the unwillingness of farmers to sell their donkeys. For instance in 2013 donkey prices ranged from P367 to P500 per animal, depending on the region [15]. These prices have increased just slightly in ten years. In 2003, Botswana Agricultural Census Report reported a price of P99 to P334 per donkey [14]. These prices are much lower than that of goats and sheep [15]. The low prices of donkeys were also reported in Zimbabwe [19]. The few farmers that sold donkeys in Bobonong sold at most 5 donkeys per year [17].

Promotion of donkeys:

The low value given to donkeys might be due to the fact that its main role in most cultures is only to work, that is, providing draft power and cart pulling. Once donkeys have passed their working life they become useless to their owners and they just wait to die. This scenario is common in most African countries such as Malawi [9]. Therefore, several possibilities of using donkeys to provide other outputs and cash need to be explored. Increasing population of donkeys may put pressure on veldt and increase competition with other species for grazing. The increasing donkey population may be caused by couple of factors. Firstly, there is no reliable and organised market for donkeys. This means even if the donkey is no longer used because of its old age, there is no where it can be disposed, thus the farmer ends up having many donkeys most of which are no longer used. Secondly, farmers are not knowledgeable when it comes to exactly how many donkeys are needed to pull a cart or a plough with different loads, therefore, they keep many donkeys unnecessarily.

Going forward to promoting donkeys, more research has to be done to explore how donkey meat can be used so that reliable markets can be developed. Furthermore, research has to be done to determine the pulling force that donkeys have. The outcome of this research might help to guide farmers to keep number of donkeys only enough to provide draft power instead of keeping many unused animals. This, together with other ways of promoting sale value of donkeys might make donkeys to be of economic importance in Botswana.

Donkey meat production:

Donkey meat is eaten by people in other countries such as Mexico, China, Italy, Ghana [8], [24], [2], [3]. In Mexico donkey meat is not consumed locally only but it is also exported [3]. Donkey meat demand in countries where donkey meat is needed may be sought and if it is promising then, donkey market should be established in Botswana. This development may change the perspective of farmers about the value of donkeys and the donkey management might improve.

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In Italy and Ghana donkey meat is used to make sausages [8], [2]. This practise may be tried in Botswana to see how consumers respond to it. However, sausages produced from donkey meat should be well labelled so that consumers who do not eat donkey meat can be informed and avoid buying those sausages. [2] reported that there were no sensory difference between sausages with donkey and those without donkey meat.

Donkey milk production:

Another donkey product which its use should be explored is milk. Donkey milk is reported to be good for skin care [8]. It is used in making soaps, skin moisturizers and cosmetics. It is further reported to be nutritious and to have medicinal properties. The nutritional composition of donkey milk has been studied in Italy [5], [11] and it seems good enough for human consumption. Donkey milk fat has less of saturated fatty acids compared to that of cows [11]. This attribute makes the milk to be essential in this era of health issues associated with saturated fatty acids.

The milk is indicated to be similar to the human breast milk in protein content [20]. It is further reported to have the possibility of replacing cow milk from milk formulas for infant who have cow's milk protein allergy (CMPA) but cannot be breast fed due to their mothers' medical conditions [22], [20]. Donkey milk is also used to make cheese in Italy [6]. However, before venturing into donkey milk sales, the sustainability of this enterprise need to be evaluated by determining traits such as milk yield.

There is a farmer in Botswana who has been keeping donkeys for dairy production since December 2014. This farmer has observed that donkey milk alleviates some disease conditions such as asthma, arthritis and heart conditions (Visaggie, verbal communication). There are soaps produced in Botswana from donkey milk. According to the donkey milk producer in Botswana, initially people were reluctant to buy donkey milk and its products, but now they are flocking for them. The donkey milk and its products are presented in Figures 1 and 2. Visaggie (verbal communication) indicated that one jenny can produce a maximum of 0.5 litres per day, but because some milk need to be left for the foals, only 0.25 litre milk is produced per jenny. This implies that for the donkey milk producer to increase milk production, more jennies have to be kept.

Fig. 1 Donkey milk bottled for sale. Source: Visaggie (Kalahari Donkey Milk Facebook post)

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Fig. 2 Soaps made from donkey milk. Source: Visaggie (Kalahari Donkey Milk Facebook post)

Donkey hides

Donkey hides are said to be used for medicine in China. There is a Chinese investor who seeks to export donkey hides to China (Botswana daily newspaper, 14 December 2015). Exporting this by-product and meat to China should be explored as it may benefit Botswana donkey owners and eventually the economy of Botswana.

III. CONCLUSION

The donkey population is generally increasing, which is a good thing if donkey products are to be produced for sales purposes. The donkeys are mainly used as draught power animals with few people consuming their meat and milk. They are kept under traditional system characterised by lack of supplementary feeding, lack of veterinary care and poor housing. Improved management and exploration of markets might make donkeys to be more than just a work animal but they can in addition, generate income through sales of products such as milk, meat and hides. The improved utilisation of donkeys has the potential of ensuring food security for small holder farmers. A survey has to be conducted throughout the regions of Botswana to determine peoples' opinion on development of donkey market and exploring use of other donkey products.

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