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Prevalence and characterization of claw lesions in free ranging short horn Zebu cattle of Kishapu district, Shinyanga Tanzania

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Abstract

This study was conducted in three villages of Talaga ward in Kishapu district, Tanzania to determine prevalence and characterize claw lesions and deformity in free ranging short horn Zebu. The study involved physical evaluation of 1000 short horn Zebu in 65 different households keeping livestock. The herds were visited once in each of the wet and dry season. The claws were examined for presence or absence of abnormalities. The overall prevalence of claw lesion was 11.1%, (n=110). The dry and wet season prevalence rate was 5.9%, (n=59) and 5.1%, (n=51) respectively of all short horn Zebu examined. No significant difference was observed on occurrence of digital dis-orders between dry and wet season (P>0.05). Claw lesions and deformity observed included hoof overgrowth and sole erosion 5.7 %, (n=57), dermatitis interdigitalis 3.5%, (n=35), flattened claw 1.1%, (n=11), vertical fissures 0.1%, (n=1), horizontal fissure 0.1%, (n=1), atrophied and inward curled claws 0.1%, (n=1) and concavity of the lateral hoof toe 0.1%, (n=1). The lateral claws of short horn Zebu showing overgrowth had their sole width much wider than the corresponding measurements in normal animals (P<0.05). The study confirms presence of claw disorders which may be potential economic problem in free ranging short horn Zebu.

Keywords: hoof overgrowth, lameness, short horn Zebu, Tanzania

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Introduction

Impaired claw health is one of the major problems causing production loss and impended animal welfare. The effect of diseases on the claw leads to development of lameness. Lameness is a multifactorial disease and is directly related to management, nutrition and feeding, housing; concurrent disease, walking surfaces, genetic predisposition aggravated by poor foot hygiene (Montoya, 2006, Berry, 2009). Lameness is known to be a serious problem that affects animal behaviour and performance; however, the conditions have often been neglected and underestimated (Cruz et al., 2001) probably due to difficulties in handling of bovine foot (Raven, 1985; Bergrsten et al., 1998) and ignorance on the significance of the condition. Lameness is a major problem in diary herds (Enting et al., 1997; Offer et al., 2000; Vokey et al., 2003) but has also been observed in other production systems (Al Sadi et al., 2011). Digital disorders are known to affect both diary and beef cattle kept in intensive system. However, there is a paucity of information regarding digital disorders in extensive livestock keeping system, particularly the pastoral system in Tanzania. Increased reports on the number of cattle manifesting lameness in Kishapu district prompted this investigation in order to (i) identify and characterize claw lesions and/or dis-orders causing lameness (ii) identify probable cause of lameness (iii) suggest possible management intervention.

Materials and Methods

The occurrence of lameness and characterization of claw lesions was investigated in three villages of

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Nhobola, Kijongo and Ngunga in Talaga ward in Kishapu district, Shinyanga region where high incidences of lameness was reported in free ranging short horn Zebu. The total number of short horn Zebu in Talaga ward was estimated to be 10000. The sample size was estimated based on the total population of short horn Zebu on the study area. Since the magnitude of the problem was unknown, the estimated prevalence of 50% was assumed to give maximum sample size, and calculated to 1000 animals (Martin et al., 1987).

Sampling of study households was done randomly where; the list of short horn Zebu owners was prepared by village executive officers from whom every fifth name in the list was selected. A total of 65 households were sampled in dry and wet seasons. From each household, the whole herd was examined for claw dis-orders. Lame short horn Zebu were restrained with the problem claw raised up on the flat chair, washed with soap and water to remove dirty debris, then the exposed lesions causing lameness were identified, characterized and finally claw measurements taken. Measurements were also taken on normal short horn Zebu and used as control. Measurements of the claw length, width and bulb height were made as previously described (Mgasa, 1991). The sole length was measured from the base of bulb interiorly to apex of sole, sole width was measured on the broadest part of sole from abaxial wall to medial wall. Bulb height was measured from the base of bulb upward to the coronary margin and the toe length was measured from the point where the hoof joins the skin anteriorly to the apex of toe.

A t-test statistic was carried out to compare differences in occurrences of the claw lesions between dry and wet seasons while ANOVA test was carried out to compare the toe and sole length, sole width and bulb height between the clinically normal and sick animals. A probability value of 0.05 or less was considered significant.

Results

The overall prevalence of claw lesion was 11.1% where the dry and wet season prevalence was 5.9% and 5.1% respectively. There were no significant differences in the occurrence of digital lesions and deformities between dry and wet seasons (P> 0.05). Hoof overgrowth and sole erosion, and interdigital dermatitis were found to be the common dis-orders observed in free ranging short horn Zebu. Other claw lesion like vertical hoof wall fissures, horizontal hoof wall fissures, raised up toe, concavity of the toe, atrophied and curled inward of toe accounted for only small proportions. Overgrowth of lateral claw and medial claw with curled inwards toe was observed in 0.1% (n=1) of short horn Zebu while another 0.1% (n=1) showed concavity of the hoof wall. The types and seasonal occurrences of the various claw lesions observed during the present study are indicated in Table 1.

Table 2 shows claw measurements in normal and those showing overgrowth. Claw measurements were only possible for claws which were not highly deformed. For both fore and hind limbs, the sole width of lateral claws of the sick animals were significantly longer (P<0.05) than those of the normal short horn Zebu (Table 2). Measurements of front limbs showed the lateral and medial claws of normal animals to range from 2.6 to 3.8cm and 2.5 to 3.7cm respectively. In affected animals, these measurements ranged from 3.1 to 4.7cm and 2.8 to 4.6cm for the lateral and medial claw respectively. Measurements of claws width in hind limbs of normal animal was found to range from 2.7 to 3.7cm for the lateral claw while the medial claw width ranged from 2.6 to 3.6cm respectively. The lateral sole width of hind limbs in sick animals ranged from 2. 7 to 4.1cm and medial claws width varied from 2.7 to 4.5cm respectively.

Discussion

Hoof overgrowth, sole erosion and dermatitis interdigitalis was found to be the major claw conditions that caused clinical lameness in free ranging short horn Zebu. Other lesion like vertical hoof wall fissures, horizontal hoof wall fissures, raised up toe, concavity of the dorsal aspect of abaxial wall, atrophied and curled

Table 1: Seasonal distribution of hoof/claw lesions in short horn Zebu and their frequency in Talaga ward Kishapu District (n = 1000)

Lesion	Dry season	Wet season	Number affected	Number affected (as % of total animals examined)
Hoof overgrowth and sole erosion	37	20	57	5.7
Dermatitis interdigitalis	11	24	35	3.5
Flattened claw	6	5	11	1.1
Traumatic	1	2	3	0.3
Horizontal hoof wall fissure	1	-	1	0.1
Vertical hoof wall fissure	1	-	1	0.1
Hoof atrophied and curled inward	1	-	1	0.1
Bulb abscess	1	-	1	0.1
Total short horn Zebu examined	59	51	110	11.1%

Table 2: Claw measurements in cm of the toe length, bulb height, sole length and sole width in the front and hind limbs of short horn Zebu

Parameter/Limb		Normal		Affected	
FRONT LIMBS		Range	Mean ± SD	Range	Mean ± SD
Toe length	Lateral	4.7-6.1	5.4±0.7	5.3-7.3	6.3±1.0
	Medial	4.8-5.8	5.3±0.5	5.1-7.3	6.2±1.1
Bulb height	Lateral	4.0-5.6	4.8±0.8	4.6-6.4	5.5±0.9
	Medial	6.6-8.6	4.8±0.8	4.5-6.1	5.3±0.8
Sole length	Lateral	6.6-8.6	7.6±1.0	7-9.4	8.2±1.2
	Medial	6.5-8.5	7.5±1.0	7.1-9.3	8.2±1.1
Sole width	Lateral	2.6-3.8	3.2±0.6[a]	3.1-4.7	3.9±0.8[b]
	Medial	2.5-3.7	3.1±0.6	2.8-4.6	3.7±0.9
HIND LIMBS					
Toe length	Lateral	4.7-6.1	5.4±0.7	5-7.8	6.4±1.4
	Medial	4.7-6.1	5.4±0.7	5.1-7.3	6.2±1.1
Bulb height	Lateral	4.1-5.6	4.9±0.8	4.5-6.3	5.4±0.9
	Medial	4-5.6	4.8±0.8	4-6.2	5.1±1.1
Sole length	Lateral	6.3-8.3	7.3±1.0	7.6-9.8	8.2±1.6
	Medial	6.3-8.1	7.2±0.9	7.8-9.4	8.1±1.3
Sole width	Lateral	2.7-3.7	3.2±0.5[a]	2.7-4.1	3.4±0.7[b]
	Medial	2.6-3,6	3.1±0.5	2.7-4.5	3.6±0.9

Means with different superscripts in the same rows are significantly different at P<0.05

inward toe were encountered only in small proportions and did not result into clinical lameness. Hoof over growth and interdigital dermatitis were lesions commonly found on the hind feet and appeared to affect more the outer claws. The study also found that, affected animal had their lateral sole width of both limbs much wider than the corresponding measurements in the control. These results are in agreement with other report (Vermont and Greenough, 1996) where short horn Zebu kept out doors developed longer toes and wider sole width on their lateral claws than those housed in doors. The occurrences of hoof overgrowth were associated with ingestion of a poisonous plant by short horn Zebu known to local people as "songa" which means elongation (Mulongo, 2008). The plant was scientifically recognized as one of the crotalaria species (Mosha et al., 2002). Poorly constructed house, walking animals a long distance to grazing and lack of routine hoof care appear to be the predisposing factors to other claw lesions.

The results of the present study show that claw lesions are important problem affecting free ranging short horn Zebu in Kishapu and indirectly affect the health and productivity of the animal. Most of the problems observed can be controlled by improved management. Routine hoof trimming, proper selection of grazing areas, improved hygiene and foot bathing are known to improve digital health (Raven, 1985). Such practice ensures early detection and treatment of several digital diseases (Mgasa and Arnbjerg, 1993). If these preventive measures are taken into considerations, the health status and productivity of free ranging short horn Zebu of Kishapu can be improved.

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