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PREVALENCE OF INJURIES SUSTAINED BY RUMINANT ANIMALS IN AZARE, KATAGUM LOCAL GOVERNMENT AREA, BAUCHI STATE

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ABSTRACT

A research was conducted in 2014 at College of Education Azare, Bauchi state to investigate the prevalence of injuries sustained by ruminant animals in Katagum LGA, Bauchi state. The data used were mainly obtained by the use of well structured questionnaires administered randomly among 100 livestock farmers to cut across sex, religion, ethnicity, educational background, ages and all social barriers. The questionnaires were designed in such a way as to furnish information on the prevalence of injuries sustained by ruminant animals of the respondents as well as information relating to various aspects of animal injury. The questionnaire complemented with face-to-face oral interviews and personal observations were also adapted for the study. Simple statistical and descriptive analysis involving the use of tables and simple mathematical percentages were used to analyze the data. Result unveiled that broken horns (28%), broken limbs (26%) and skin lesions and bruises (14%) were the common injuries sustained by livestock. Fighting (52%), predators (13%) and broken bottles and glasses (9%) were found to be the main cause of injury. Level of mortality rate due to injury sustained is high in cattle (46%), sheep (26%) and goats (28%). The result also revealed that goat (39%) sustained injury more often than cattle and sheep (33% and 28%) respectively. It was also observed that growing animals (45%) sustained injuries more than adults (43%) and infant (12%). The result further gathered that male animals (61%) had the highest injury recorded compared to their female counterparts (39%) and these animals' sustained injuries mostly during the dry season (51%) than in the raining season (49%). It can be concluded that grazing of ruminant in the bush during the dry season in the study area is a major risk factor for injuries, which may consequently affect the welfare, productivity, and health status of ruminants.

Keywords: Ruminant, injury, Fracture, Bruise, Dislocation, Wound.

INTRODUCTION

Scientific research has shown that warm-blooded animals (this includes livestock) feel pain and the emotion of fear because they have brain structures that enable them to feel fear and suffering from pain, and it is likely that they suffer pain in the same way as humans. Fear, pain and stress which effect of injury and suffering affect the quality and value of meat obtained from this livestock. An injury is a wound in which skin is torn, cut or punctured (an open wound), or where blunt force trauma causes a contusion (a closed wound). It can also be defined as a term comprising such conditions as fractures, wounds, sprains, strains, dislocations, concussions, and compressions. In addition, it includes conditions resulting from

extremes of temperature or prolonged exposure. Acute poisoning (except those due to contaminated food) resulting from exposure to a toxic poisonous substance is also classed as injuries (Dictionary of military and associated terms, 2005). Injuries sustained by animals are major occupational health and safety issues for agricultural industries (Broom, 2008). In modern livestock industries, majority of the injuries that have direct and immediate economic effect are those sustained by the animals during handling, transportation, unloading and slaughtering (Minka and Ayo, 2007). Currently there are limited or no information in the available literature on the incidence and causes of injuries sustained by ruminants grazed during the raining and dry seasons of the year. Such information if available would be useful in enhancing the welfare of the animals, and consequently meat quality in the market (Minka and Ayo, 2011). Injuries or factors that predisposes ruminant animals to injuries includes: injuries caused by parasites that pierce and destroy skin (Boden, 2005; Iposu *et al.,* 2011), grasses and thorn bushes, bad topography terrain (Nayaranan *et al.,* 2003; Cook *et al.,* 2005; CABI international, 2007; Minka and Ayo, 2011; Soromessa, 2011; FAO, 2012), fighting e.g. fractures, dislocation and broken horns (David, 2012; NADIS, 2013), lumps under the skin (FAO, 1994), objects e.g. broken bottles, wires, nail, polythene bags e.t.c. (Mohammed, 2004; Ghurashi *et al.,* 2009; Igbokwe *et al.,* 2003; Bakhiet, 2008), fence and bruising (FAO, 2001) are responsible for significant economic loss throughout the world (McDonald, 2003). Injuries causes meat wastage and reduce the carcass value because the injured parts or in extreme cases the whole carcass cannot be used for food and are condemned (FAO, 2001; Ekanem *et al.,* 2011). Injuries causes meat wastage and reduce the carcass value because the injured parts or in extreme cases the whole carcass cannot be used for food and are condemned (FAO, 2001; Ekanem *et al.,* 2011). Hides and skins of slaughter livestock can be damaged by thoughtless handling and treatment of these animals in the following ways: Before slaughter including indiscriminate branding; injuries from thorns, whips, sticks, barbed wire and horns; unsuitable handling facilities; badly designed and constructed transport vehicles; and during slaughter including causing the animal to become excited and injuring themselves; hitting or forcefully throwing the animals; dragging the carcass along the ground alive or dead. Careless damage to hides and skins will cost the industry much loss. The main objective of the study is to investigate the incidence of injury sustained by ruminant animals and identifying the various types of injuries and which injury is most commonly sustained by ruminants in Katagum local government area of Bauchi state.

MATERIALS AND METHODS

Study area

The study was conducted at the Animal Farm of College of Education Azare Bauchi State in

2014. Azare is a town in Bauchi State, Nigeria. Azare is the second largest town in Bauchi State. It is located at 11^0 40 N 10^0 11E, at an elevation of 436 meters above sea level. It is 250km north of the state capital, Bauchi. It has an estimated land area of 11200 square kilometers (Katagum at a glance, 2003) located within the Sudan savanna agro-ecological zone of Nigeria with a population of 293, 970 people (NPC, 2006). The area is characterized by two distinct seasons, that is, five (5) months of rainy season (April - September) and seven (7) months of dry season (October – March) (Bura, 2000). The annual rainfall is unimodel which averages about 700mm with a maximum temperature of 35^0C. The mean monthly temperatures ranges from 20.10-22.50^{0}C in December and January to 30.0-32.5^{0}C in April and May. The temperature of the rainy season remains steady between 25^0C-27^0C for the month of June to October. The soils in the area

are formed normally from Aeolian and/or alluvial deposits, and belongs to the entisols or inceptisol orders and the soil temperature regime is iso-hypothermic. The geology of the area is made up of sedimentary rocks comprising the kerri-kerri (sandstone) and Chad formation (Mustapha and Fagam, 2006).

Source of Data

The data used for this study were mainly primary data obtained by the use of a well structured questionnaires administered randomly among 100 livestock farmers in Katagum local government areas to cut across sex, religion, ethnicity, educational background, ages and all social barriers. The questionnaires were designed in such a way as to furnish information on the incidence of injuries sustained by ruminant animals as well as information relating to various aspects of animal injury in Katagum local government area, Bauchi state. The questionnaire complemented with face-to-face oral interviews and personal observations were also adapted for the study. Retrieval of the questionnaires was done two weeks after administering so as to allow enough time to answer.

Data collection

Data used for the study were obtained from both primary data. The primary data, which were cross sectional in nature, were collected through survey, involving administration of questionnaire by personal contacts, and personal discussion.

Statistical analysis

Simple statistical and descriptive analysis involving the use of tables and simple mathematical percentages were used to group the respondent according to age, sex, marital status, education and occupation.

RESULTS AND DISCUSSION

The socio-economic characteristics of the respondents are presented in Table 1. It revealed that most of the respondents (29%) were within the age range of 46-60 years and above indicating that younger persons are not into the profession probably due to slow financial returns. It could be attributed to the more settled life of the older persons thereby encouraging rearing of animals even as a secondary occupation (Abu *et al.,* 2011). It also shows that the respondents were within the economically productive age (i.e.15-64 years) as defined by Food and Agricultural Organization (FAO, 2003), while none of the respondents fell below the age of 15 or above 70 years which is the dependent age as stipulated by FAO (2003). This corroborates the findings of Ajala *et al.* (2008) on the age range of small ruminant farmers in the Northern Guinea Savannah zone of Nigeria.

The study also unveiled that males (91%) participated in rearing ruminant animals than female (9%). This is in contrast to previous findings (Lebbie, 2004; Aminu *et al.,* 2006) that some farm units are largely the property of women and their children with women taking major decisions and responsibilities relating to production and marketing. The result conforms to the norms and values of the study area where most of the women were kept in the house for domestic activities because of their religious teaching and rules (Abdullah, 2014). However, ruminant production is not limited by age, gender and or disability (Rodrigo, 2004).

The result also shows that 42% of the respondents had tertiary education and the minimum education (16%) being primary education. Educational levels seem adequate and capable of meeting the challenges that may occur with introduction of advances in ruminant production. It is believed that the respondents who had formal type of education may have been exposed to some theories and practices of animal health to some extent in the subject of agricultural science which forms part of the primary and secondary school curriculum (Adeneye *et al.,* 2013). Those that are literate tends to accept information with regards to agricultural practices compared to those that are illiterate who find it difficult to accept changes

in whatever regards due partly to their believes and cultural behaviours. It could be referred therefore, that the respondents were literate. For the purpose of adopting new technologies, education is an important factor which if lacking can have adverse effect on future production improvement (Umunna *et al.*, 2011). The high level of literacy can provide scope for an information interface between farmers, extensionist, researchers and development agents (Umunna *et al.*, 2011).

Table 1. Socio-economic characteristics of ruminant rearers in Katagum L G A.

Characteristics	Respondents	Frequency	Percentages (%)
Age	15-20	20	20%
	26-35	24	24%
	36-45	27	27%
	46-60	29	29%
	61-70	0	0%
Gender	Male	91	91%
	Female	9	9%
Marital status	Married		
	Single		
Educational level	Tertiary education	42	42%
	Secondary education	24	24%
	Primary education	16	16%
	Non-formal education	18	18%
Occupation	Civil servant		
	Trader		
	Farmer		

Source: Field survey (2014)

Table 2 shows the various types of agricultural activities, types of animals reared and the management system of rearing animals in the study area. It was revealed that 50%, 36% and 14% of the respondents engaged in animal production, crop production and processing and marketing of agricultural products respectively. Moyo *et al*. (2010) noted that for most of the 2.6 billion people who depend on smallholder farming systems, livestock production is an important way of diversifying income sources. It could be attributed to the fact that ruminants are multi-functional animals and can play a significant role in the economy and nutrition of rural and urban dwellers (Oluwatomi, 2010).

The table also uncovers that 92% of the types of animals reared in the study area are ruminant animals. Ruminants serve as insurance against crop failure and unknown future because they can quickly be converted to cash in times of financial need (Hoddinot, 2006; Ajala *et al.*, 2008;

Sodiya *et al.,* 2011). It could also be attributed to land requirement, capital expenditure and labour to produce ruminants are inexpensive (cost of housing, equipments and feeding is relatively low) (Ndor, 2004; Adebayo, 2006; Apata and Adewumi, 2011). This finding is in tandem with the report of Abu *et al.* (2011) that ruminant rearers generate about ₦5000.00 monthly which can play a part in food nutrition and security. They are important items gathered by rural and urban people for subsistence or for local and external trades within the humid West Africa, be it in small and large scale production (Jimoh and Adebisi, 2005; Adewunmi *et al.,* 2009; Tee and Amonum, 2008; Aphunu and Akpobasa, 2009). Ruminants are multipurpose animals; they produce milk, meat, pelts, hides and skin, wool and fibre including other products utilized within the household or are marketed or have scio-cultural or religious significance (Tee and Amonum, 2008; Adewunmi *et al.,* 2007) or for agro-based allied industries with huge economic potentials that may contribute to the GDP of a developing society (Abdelatif *et al.,* 2009). Ruminant hide is a valuable commodity used for a number of products (Adewunmi *et al.,* 2007). This makes them livestock of choice compared to their monogastric counterparts (Umunna *et al.,* 2011).

Table 2: Types of animals and their management systems

Characteristics	Respondents	Frequency	Percentages (%)
Types of agricultural activities	Animal production	45	45%
	Crop production	31	31%
	Mixed farming	15	15%
	Processing and marketing of agricultural products	09	09%
Types of animals	Ruminants	92	92%
	Pseudo-ruminants	3	3%
	Non-ruminants	5	5%
Systems of livestock rearing	Intensive	28	28%
	Semi-intensive	33	33%
	Extensive	39	39%

Source: Field survey (2014)

The table also shows that 39% of the respondents did not provide any form of housing for the animals. The idea of making ruminants travel to their feed instead of delivering the feed to them has been an economically wise strategy and has also been utilized in winter grazing systems (Kumar *et al.,* 2012). Under the traditional system, there is the use of indigenous methods in all aspect of ruminant production including health management (Mafimisebi *et al*., 2012). Also winter grazing has the potential to lower costs associated with winter feeding such as manure removal, maintenance of fencing and wind breaks, labour, and feed, while still maintaining adequate animal performance (Kumar *et al.,* 2012).

The study revealed that 36% of the respondents practice the extensive system while intensive and semi intensive system recorded 28% and 33% respectively. It could be attributed to the report by FAOSTAT (2005) that in Africa, where grain is scarce, 230 million cattle, 246 million

sheep, and 175 million goats are supported almost entirely by grazing and browsing. Some four fifths of world beef and mutton production, roughly 52 million tons, comes from animals that forage on rangelands. The animals are grazed on flatland, roadsides, and forestland and on land not used for agriculture using the free range systems (FAO, 2004). Most of the times such free-roaming ruminants are commonly seen in the environment in the city as they make use of land resources by scavenging for available feed particularly in the refuse dumps (Hassan and Kikisagbe, 2001; Taiwo *et al.,* 2004). It was established that scavenging animals performed better than those raised in confinement (Sonaiya, 2009), resulting in increased productivity and profitability (Mwalusanya *et al.*, 2002; Saina, 2005).

Table 3 shows the injuries sustained by ruminant animals in the study area. The result indicated that the most common type of injury sustained by ruminants in the study area was broken horns (28%), broken limbs (26%), skin lesions and bruises (14%) and mouth injury (13%). The result is in agreement with previous work that traumas, especially fractures, are responsible for most of proximal cases of lameness reported in Brazil (Camara *et al.,* 2014), but also more rare cases of muscle trauma or degenerative lesions (Barbosa *et al.*, 2014) have been implicated. The incidence of lameness is so high in many ruminant herds that treatment of all lame cows is not feasible (Horseman *et al.,* 2013). Lameness in a cow impacts the way and amount she eats, lowers her reproductive success, affects her quality of life, and minimizes her overall value to the herd (Huxley, 2013) causing annual losses of up to $ 75 per cow (Bruijnis *et al.,* 2010). This may be attributed to horn injuries from another animal during fight, fall or herdsman stick. It could also be attributed to the most prominent behaviour of all ruminant during the heat of the rut which is fighting, where male animals show their true dominance to others. Although, this is in contrast with the report of Minka and Ayo (2011) who reported that the most common type of injury sustained by ruminants was lacerations and bruises and that the most frequently injured part of the body was the trunk, closely followed by the limbs and neck, especially in the cow. Similar observations that lacerations and bruises are the major injuries encountered by different livestock animals during their management were reported (Minka and Ayo, 2007; Gregory, 2008; and Guardie *et al.* 2009).

Table 3: Injuries sustained by ruminant animals

Injury	Respondents	Frequency	Percentage (%)
Types of injuries sustained by animals	Broken limbs (fore and hind limbs)	26	26%
	Broken ribs	9	9%
	Broken horns	28	28%
	Broken jaws and teeth	2	2%
	Eye damage	5	5%
	Skin lesions and bruises	14	14%
	Mouth injury	13	13%
Mortality rate due to injury sustained	Cattle	46	46%
	Goat	28	28%
	Sheep	26	26%
Breeds that sustain injury more often	Cattle	33	33%
	Goat	39	39%
	Sheep	28	28%
Stages which injury mostly occur	Infant stage	12	12%
	Growing stage	45	45%
	Adult stage	43	43%

Source: Field survey (2014)

The table also revealed that cattle had the highest (48%) mortality rate as a result of the injury sustained followed by goat (28%) and sheep (26%). The result showed that the entire animal observed during the study period sustained different types of injuries. This is because among ruminant particularly cattle fight goes on until death, and if not, it is not unusual to see one of them get injured. The result also agreed with the findings of Gregory (2008) who showed that thousand of animal's related injuries occur each year while some even result in death.

Among the breeds of ruminant animals, goats ranked first (39%) as ruminant breed that sustained injury most often while cattle and sheep recorded 33% and 28% respectively, It could be attributed to the time goats often spend selecting high quality material if the feed offered or available is of low quality which could result to sustaining injury in the process. In natural conditions goats consume up to 25 plant species per day; sheep not more than 12 (Sanon *et al.*, 2006) which formed another source of hazard for wandering goats and sheep seeking for areas rich in bushes and water (Suhair Sayed Mohammed, 2012). Several studies have shown that goats differ from other ruminants in feeding behaviour, level of intake, diet selection, taste discrimination, and rate of eating due to the differences in anatomy and physiology (Ngwa *et al.*, 2000; Lu *et al.*, 2005).

The table also revealed that growing ruminant animals recorded the highest (45%) values of sustaining injuries while infant and adults had 12% and 43% respectively. It could be attributed to the more time they spend grazing compared to the older animals (Krysl and Hess, 1993).

The sex, season and the common causes of injury in the study area is shown in table 4. Male animals recorded highest (61%) while female animals recorded lowest (39%). This is because during the rut, males often rub their antlers or horns on trees or shrubs, fight with each other, wallow in mud or dust, and herd oestrus females together. In ruminants, social dominance is clearly established, quite stable and a linear hierarchic order exists in a flock. Dominance value of animals was the most important factor influencing the use of feed resources especially when resources are offered under group feeding and also in short supply (Shinde *et al.*, 2004). According to Shinde *et al.* (2004), high-ranking male were first to occupy the trough when feed was offered and also spent more time in eating feed and fodder than medium and low-ranked animals. Low-ranking animals generally preferred to consume feed when dominant animals were idling to avoid conflict (Shinde *et al.*, 2004). This is contrary to Minka and Ayo (2011) who reported that the high number of injuries and their severity recorded in the cows compared to the males suggesting that cows are more active during grazing than the bulls or calves; consequently, they had more contact with the risk factors of injuries. In addition, there might be increased appetite of female animals due to the nutritional demands during pregnancy and lactation.

The result also uncovered that dry season (51%) is the period with which ruminant animals sustain injuries most while raining season recorded 49%. This may be attributed to shortage of forages in dry season and the animals are grazing freely. Sometimes in search of food these animals change their habitat and enter adjacent ecosystem for food and may come in contact with predators and diseased domestic animals or they change their food habits and eat anything available which may prove fatal to them (Shirbhate, 2007). Mohammed (2004) predicted that foreign bodies would be a growing problem for grazing animal especially as grazing land becomes more and more polluted with plastics, ropes, hairs, wool and metals particularly during the late dry season which is associated with shortages of feed especially mineral and vitamins (Ghurashi *et al.*, 2009). The free grazing animals particularly sheep and goats make use of such plastics and polythene materials are indigestible in nature (Igbokwe *et al.*, 2003) and their accumulation in the rumen may lead to adverse effect which may be reflected negatively on the animal health (Ghurashi *et al.*, 2009). Although Minka and Ayo (2011) reported that the significant number of injuries detected in cattle is in the raining season and may constitute a welfare problem.

It was observed that 52% of the injuries sustained in the study area are caused by animals fighting while predators, broken bottles and glasses and fence had 13%, 9% and 7% respectively. Minka and Ayo (2011) reported that majority of the injuries were caused by thorns, relatively sharp branches of trees, objects or shrubs in the bush or by the stock handlers as they are found of beating the animals with sticks or clubs, animals always fight.

Table 4: Sex, season and causes of ruminant's injuries

	Respondents	Frequency	Percentage (%)
Which sex sustained injuries most often	Male	61	61%
	Female	39	39%
Which season of the year animals mostly sustain injuries	Raining season	49	49%
	Dry season	51	51%
What causes injuries to livestock?	Fence	4	4%
	Thorn bushes	7	7%
	Hunters traps	4	4%
	Fighting between animals	52	52%
	Predators	13	13%
	Broken bottles/glasses	9	9%
	Nails/wires	5	5%
	Slippery floors	6	6%

Source: Field survey (2014)

CONCLUSION

Ruminant production in the study area is low despite the huge potentials of ruminant rearing. It is concluded that injuries, presence of pests and diseases and ruminants grazing in the bush during raining and dry season are associated with incidence of injuries which may compromise the animal welfare and consequently affect the meat and skin quality in the market.

RECOMMENDATIONS

Thus, it is recommended that:

1. Stock handlers should control their animals as to where they may possibly graze, to avoid areas that may contribute to injuries.
2. If injuries are detected, such injuries should be reported and treated promptly
3. Stock holders should assess the welfare of the ruminant daily after grazing before going to sleep or rest
4. Stock holders should cull some male animals they keep to avoid fighting during mating and feeding.

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