Prevalence of Gender, Age and Breed in the Occurrence of Pneumonia in Goats Slaughtered At Gwagwalada Abattoir, Abuja

Tenuche Oremaiyi. Z[1], Ubah Simon Azubuike[2], Abdul Emmanuel[1], Abalaka Samson Eneojo[1], Idoko Sunday Idoko[1], Ejike Charles Ejiofor[3], Bankole Abayomi Samuel[4]* and Enem Simon Ikechukwu[5]

Department of Veterinary Pathology, Faculty of Veterinary Medicine, University of Abuja, Abuja Nigeria[1]
Department of Theriogenology, Faculty of Veterinary Medicine, University of Abuja, Nigeria[2]
Department of Veterinary Parasitology, Faculty of Veterinary Medicine, University of Abuja, Nigeria[3]
Department of Animal Science and Fisheries, Faculty of Agricultural Sciences, National Open University of Nigeria, Abuja[4]
Department of Veterinary Public Health, Faculty of Veterinary Medicine, University of Abuja, Nigeria[5]
*Corresponding author: Bankole Abayomi Samuel

Abstract: *This study was aimed at determining the prevalence and influence of gender, age, and breed on the occurrence of pneumonia in goats in Gwagwalada. Two thousand two hundred and one lungs of different breeds of goats (Sokoto Red were 1102, West African Dwarfs were 720 and Sahel were 279); between the ages of 6- 24 months were used in this study. The frequency of occurrence of pneumonia as a percentage of the total lung volume was determined by clinical, gross and histopathological examinations. Eighty seven (87) were pneumonic (3.95% prevalence). Out of the 87 goats found to be infected, 73 were males and 14 were females which are 84% and 16% respectively. The total number of goats between the ages of 6 months to 1 year old with lung infections were 9 which is about 11% while 17 were between the ages of 1-2 years which is about 19% and those that were 2 years were 61 which is about 70%.*
The Sokoto red breed had the highest frequency of lungs affected with pneumonia with the frequency of 8.0 while West African Dwarf and Sahel Brown had the frequencies of 7.0 and 3.0 respectively. The frequency of goats at 1 year affected with pneumonia was 2.0 while the frequency of goats at 2 years old affected with pneumonia was 16.0. Histological examination revealed the presence of giant cell, fibrinopurulent, purulent and pyogranulomatous pneumonia with marked cellular infiltration, sloughing of the bronchiolar epithelium, pan and intra bronchiolar cellular infiltration. Transportation was suspected to be the major contributory factor to the pneumonia observed hence effective ante-mortem examinations will help to minimize slaughter of goats that are affected with pneumonia.
Key words: prevalence, gender, pneumonia, goats, Gwagwalada, Frequency
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I.   Introduction

The ability of goats to thrive in harsh conditions, it's relatively small size and its low cost brings it within the reach of the low income households in Nigeria (Fajeminsin, 1991). Small ruminants particularly sheep and goats contribute significantly to the economy of farmers in the Mediterranean as well as Africa and the South East Asian countries (Sandipet al., 2014). In Nigeria, apart from poor management which includes inadequate and unbalanced feeding, high disease prevalence associated with high neonatal mortality constitutes a major obstacle to the promotion of large scale holding of livestock (Majiyagbe and Lamorde, 1997). These small ruminants are value assets because of their significant contribution to milk, meat and wool production and potential to replicate and grow rapidly. The great Indian leader and father of freedom fighter M. K Gandhi "father of the nation" designated goats as "poor man's cow" emphasizing the importance of small ruminants in poor countries (Sandip et al.,2014). This was also supported by Abdel Aziz (2010) when he said that domestic goats (Capra Hircus, L) are important and domesticated animals that provide a full range of useful products to humans including meat, milk, skin and hair. They efficiently survive on available shrubs and trees in adverse harsh environment and in low fertile lands where no other crops can be grown in Nigeria. He also stated that goat production over the years is one of the major means of improving the livelihoods of poor livestock keepers, reducing poverty and attaining sustainable agricultural and universal food security. The population of goats in Nigeria is estimated at 53.8 million (FAOSTAT, 2011) of which traditional stock contributes 99.97%, while

0.03% of the stock is commercially managed (Okpeku et al., 2011). Diarrhea and respiratory diseases (pneumonia) were reported as the major causes of mortality in goats (Ackermann and Brodgon, 2000; Ameh et al., 2000). In Nigeria it has been estimated that sheep and goats provide35% of the meat needs (Obi, 1997). In spite of their large number and enormous contribution to the national economy, goat production is not well developed due to inadequate nutrition, poor management and prevailing diseases (Bekeleet al., 1992). Pneumonia can cause heavy economic losses to farmers including mortality, emaciation, poor weight gain, poor meat quality and condemnation of lungs during meat inspection (A1-Rawasdeh and Al-Qudah, 2000). The aetiology of pneumonia is complex and multifactorial which are either non-infectious or microbial determinants including bacteria e.g. Pasteurella hemolitica and Pasteurellamultocida, virus e.g respiratory syncytial virus or fungi (Garioaet al., 1998). Concurrent infection of the respiratory tract by viruses, bacteria and lung worms have been described and such disease conditions are commonly known as respiratory disease complex (RDC) indicating the difficulty to attribute to only one aetiology (Tibbo et al., 2000; Woldemeski et al., 2004). Factors such as stress and overcrowding have been identified as contributors to Caprine pneumonia, but investigation of their role in this condition is still not clear (Zamrisaad et al., 1989, Emikpe et al., 2014). This work was aimed to determine the influence of gender, age and breed on the occurrence of pneumonia in goats slaughtered at the Gwagwalada abattoir, with the objective of describing pathology of caprine lungs at the abattoir and ascertain quality of mutton supplied to our population and seeking improved abattoir management as regards ante and post mortem inspections.

II.   Materials And Methods

2.1 Area of Study
The study was carried out in Gwagwalada abattoir in Gwagwalada area council FCT Abuja, Nigeria. Gwagwalada abattoir is located on latitude 8.9393°N and longitude 7.0787°E. Gwagwalada area council has one big abattoir where animals are slaughtered on daily basis; animals slaughtered in the Gwagwalada abattoir are usually supplied from Dei dei cattle market and also from the far North of Nigeria.

2.2 Animals Studied
Two thousand, two hundred and one goats between the ages of 6 – 24 months were studied in the Gwagwalada abattoir. The breeds studied were the Sokoto Red, the West African Dwarf and the Sahelian breeds of goat. The work was carried out for 5 weeks during the rainy season (April to May)

2.3 Clinical Examination
The animals slaughtered were examined during the period of this work for clinical signs such as pyrexia, nasal and ocular discharges, dullness, rough hair coat, diarrhea, emaciation and anemia.

2.4 Gross Examination
A gross examination of the animals slaughtered was carried out daily and the ones with signs of pneumonia were recorded.

2.5 Tissue Collection
After slaughtering of the goats in the abattoir, the lungs were examined and the pluck of lungs with suspected case of lung infection was immediately transported to the Histopathology Laboratory of Faculty of Veterinary Medicine, University of Abuja. The pluck of lungs was transported in a polythene bag to the Faculty of Veterinary Medicine, University of Abuja. The 18 samples that were randomly collected for histology were fixed using 10% formalin.

2.6 Histological Preparations
The protocol for histology preparation was a modified method of El-Saba and Abdrabou (2013). Samples of the lungs were taken and fixed by immersion in l0% formalin solution. Fixed samples were dehydrated, cleared and embedded in paraffin wax. Sections of 5-6 micrometers thick were obtained and stained with Hematoxylin and Eosin for general tissue structure. The slides were viewed under the microscope.
2.7 Statistical analyses
Data were analyzed using descriptive statistics.

III.   Results

4.1 Clinical Features
Out of 2,201 goats studied, only 87 goats were pneumonic. This represents 3.95% of the total goats studied. Among the 87 goats that were pneumonic; pyrexia, dullness, rough coat, diarrhea, emaciation, nasal discharge anemia and ocular discharge were recorded in Sokoto Red, West African Dwarf and Sahel as shown

in Fig. 1. Out of the 87 goats found to be pneumonic, 73 were males and 14 were females which represent 84% and 16% respectively. The males affected with pneumonia had a higher frequency (12.7) than the females which had a lower frequency (5.0), (See Fig. 2). The total number of goats between the ages of 6 months to 1 year old with lung infections were 9 which is about 11% while 17 were between the ages of 1-2 years which is about 19% and those that were 2 years were 61 which is about 70%. The frequency of goats at 1 year affected with pneumonia was 2.0 while the frequency of goats at 2 years old affected with pneumonia was 16.0 (Fig.3). The Red Sokoto breed had the highest frequency of lungs affected with pneumonia with the frequency of 8.0 while West African Dwarf and Sahel Brown had the frequencies of 7.0 and 3.0 respectively (Fig. 4). Histological examination revealed the presence of giant cells (Fig.5), fibrinopurulent, purulent and pyogranulomatous pneumonia with marked cellular infiltration,sloughing of the bronchiolar epithelium, pan and intra bronchiolar cellular infiltration. (Fig.6 &7)
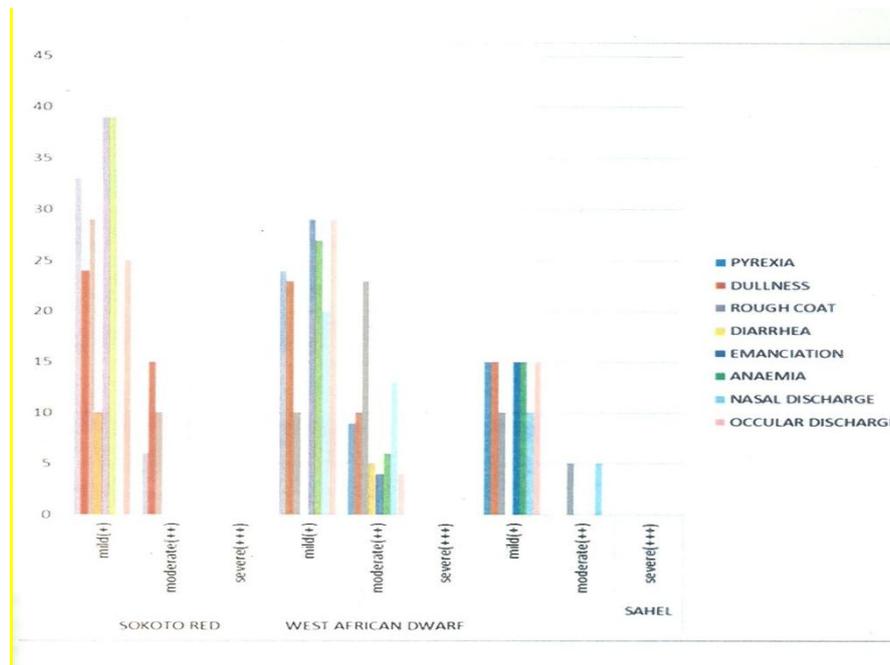

Fig 1: Clinical features of goats affected with pneumonia

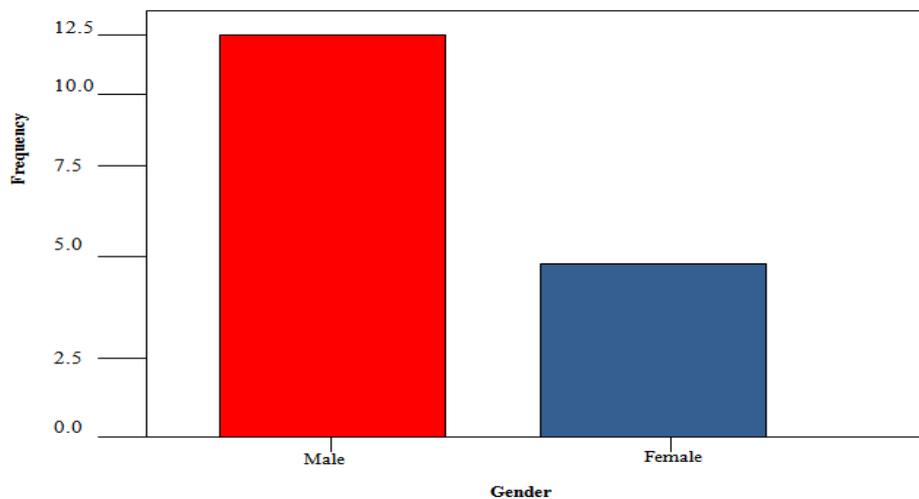(Keys: mild (+), moderate (++), severe (+++)
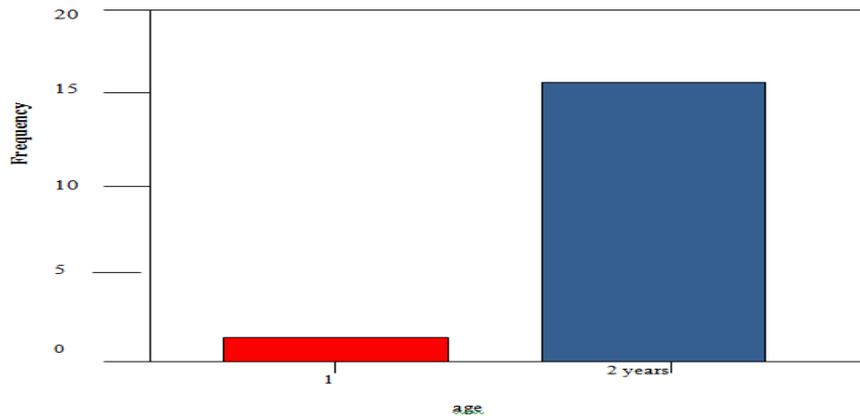

Fig 2: Frequency of gender affected with pneumonia

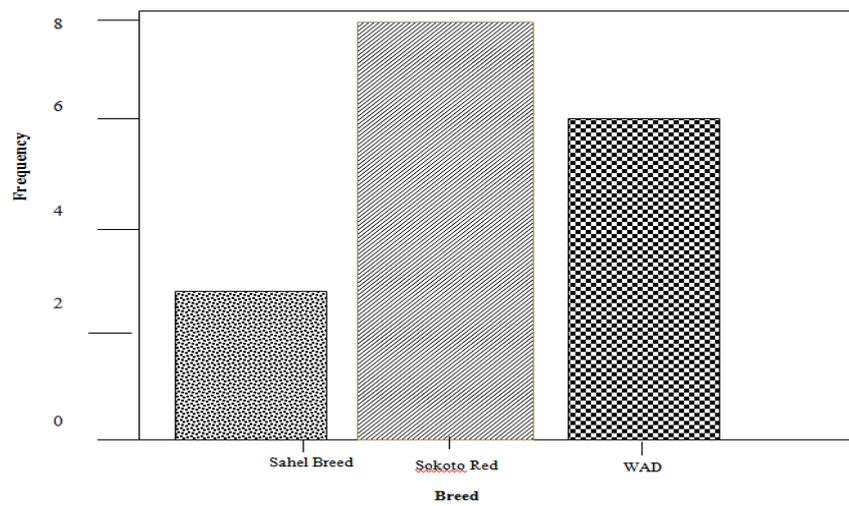**Fig 3:** Frequency of age affected with pneumonia

Fig 4: Frequency of breeds affected with pneumonia.
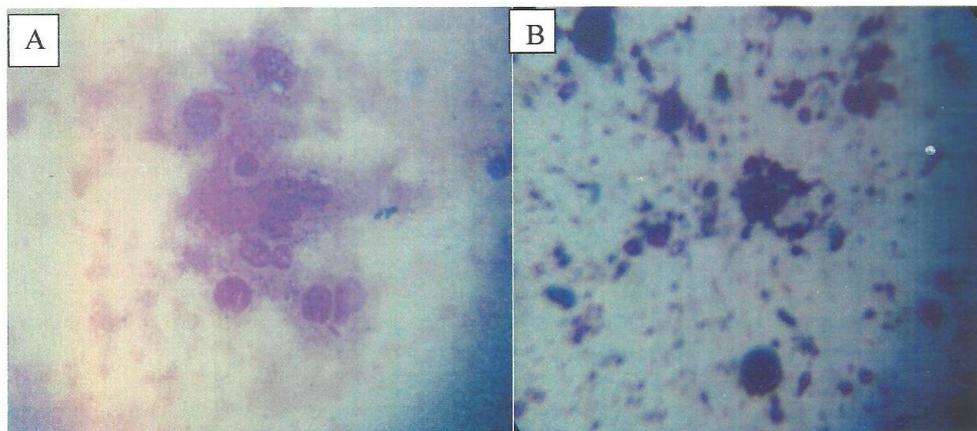

Fig. 5 (A) Photomicrograph showing gaint cells (H&E) (x100) (B) Showing lymphocytosis (H&E) (x100).
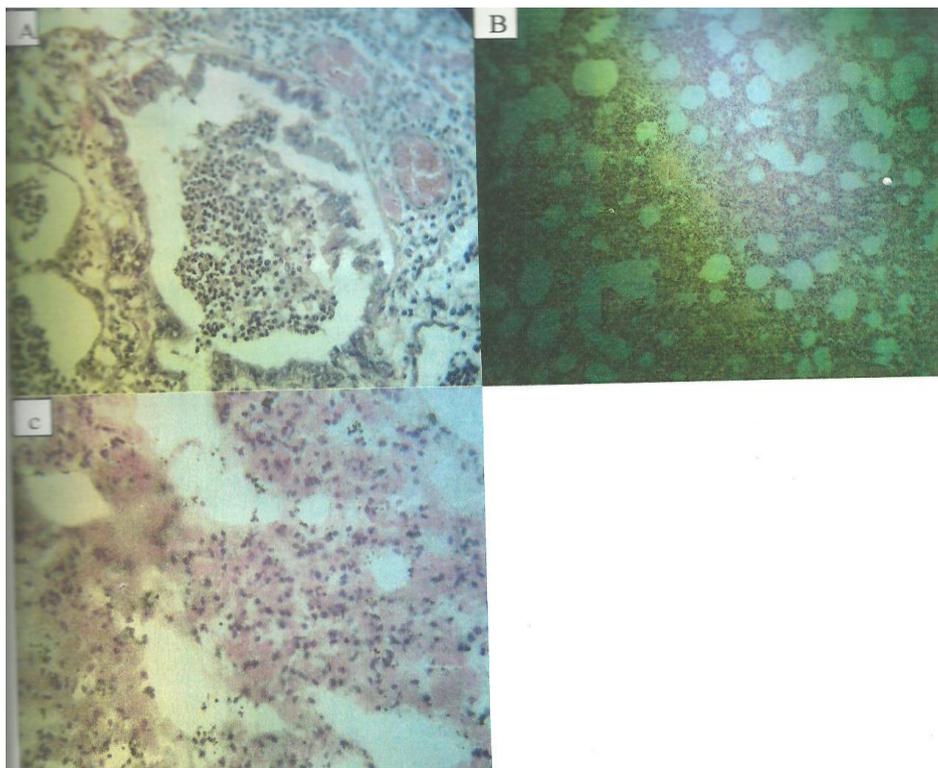
Fig 6: Photomicrographs (A) showing sloughing of bronchiolar epithelium, peri and intra bronchiolar cellular infiltration (H&E) (x100). (B) Showing marked cellular infiltration (H&E) (x40), (C) Fibrino purulent pneumonia (H&E) (x 100)
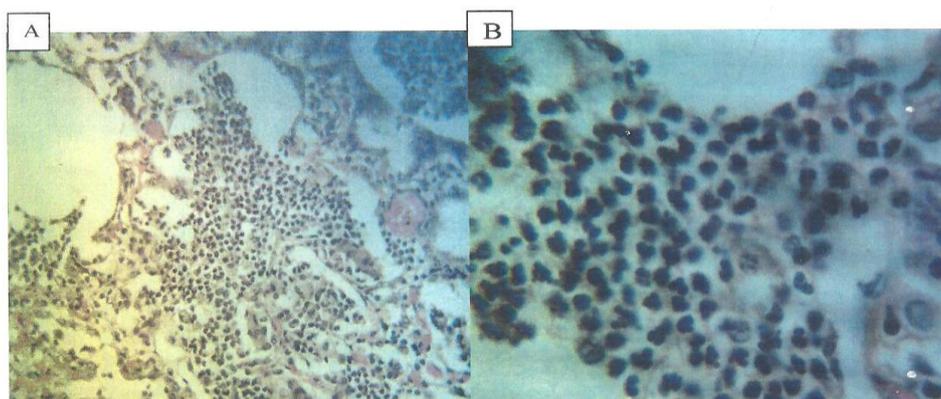

Fig.7 Photomicrographs (A) Purulent Pneumonia (H&E)(x10), (B)Purulent Pneumonia (H&E) (x100)

IV.   Discussion And Recommendations

This work has been able to establish that the prevalence of pneumonia in goats in Gwagwalada abattoir of Gwagwalada area council of the Federal Capital Territory of Nigeria during the period of study was 3.95%, the prevalence was higher in male goats than in female goats and also a higher prevalence in goats more than 12 months. Also it was found that the prevalence of pneumonia was higher in the Sokoto Red breed than in the other two remaining prevalent breeds in Nigeria which could be due to the fact the Sokoto Red was predominantly the breed slaughtered in the abattoir.

This work also supports the works of (Lawal et al., 2001) which showed that pneumonia was more common in goats between the ages of 6 months to 2 years. This further corroborated the report of Emikpe, 2013 a,b,c. This work was also able to establish that pneumonia in Gwagwalada abattoir had a higher prevalence in males than in the females which supports the work of Emikpe and Akpavie, 2010 which stated that male goats were more prone to respiratory infections possibly due to the sniffing of the females during estrus as this behavior exposes them to virus especially from infected animals with diarrhea since the feces is known to be infected with virus (Durojaiye, 1984; Ezeibe et al., 2008). This study showed that there was giant cell pneumonia which could be associated with bacterial complicated PPR commonly reported in goats as stated by

Emikpe and Akpavie, 2011. It was concluded that the prevalence of pneumonia in goats slaughtered at Gwagwalada area council was 3.95% during the study period. Gender and Age had influence on the susceptibility of goats to pneumonia with male goats predominating in occurrence. Breed of animal plays a role in the susceptibility of goats to pneumonia with the Sokoto Red breed being most susceptible. The major contributory factor to pneumonia suspected was transportation stress associated with moving animals from the far North into Gwagwalada. It was therefore recommended that the examination of goats at ante mortem should be done to minimize the slaughter of sick animals. The ante mortem and post mortem inspection carried out in the abattoir should be improved. Transportation stress should also be minimized through resting of animals at regular intervals**.** More work should be done on the prevalence of pneumonia to establish the prevalence in both rainy and dry season of the year in Gwagwalada.

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