

Prevalence of Pneumonia among Slaughtered Cattle, Goats and Sheep in Maiduguri Abattoir, Maiduguri, Nigeria

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ABSTRACT

Retrospective study on bovine, ovine and caprine pneumonia was conducted over a five-year period (2000-2004). Data were collected from the Maiduguri metropolitan abattoir and a total of 173,824 cattle, 270,339 goats and 12,587 sheep were examined at post-mortem for pneumonic lesions. Of these, 54%, 52% and 53% were males while 46%, 48% and 47% were females for the species respectively. Differences were not observed in the slaughter figures among species ($p>0.05$). A total of 361 cattle, 253 goats and 149 sheep had pneumonia with overall prevalence rates of 0.21%, 0.09% and 0.12% respectively. The data revealed that cattle had the highest number of cases (133) in 2004 while goats had the least (7 cases) in the same year. Over the years, the incidence of pneumonia amongst species was relatively unstable but not significant statistically ($p>0.05$). The low prevalence recorded in this study may be due to subclinical disease, activities of the butchers such as hiding the affected lungs from meat inspectors, slaughtering of animals outside the abattoir particularly during festive seasons and the use of antibiotics in feeds by farmers to curtail bacterial infections.

Key words: Pneumonia, cattle, goats, sheep, abattoir, Maiduguri, Nigeria

INTRODUCTION

Ruminants (cattle, sheep and goats) belong to the family *Bovidae* and play an important role in the economy of many countries (Obudu *et al.*, 1995). They are a major source of protein and income to the Nigerian economy and form an integral part of the cultural life and farming systems of the rural populace. Pneumonia is considered the greatest single cause of death (Obudu *et al.*, 1995). In Nigeria, the economic impact of pneumonia on the economy is yet to be assessed, but field experience has indicated a serious impact.

Pneumonia is the inflammation of the pulmonary parenchyma usually accompanied with bronchitis and pleurisy (Radostits *et al.*, 1994). Pneumonia can be lobar (affecting one lobe or part of a lung) or bronchopneumonia (patchy infection occurring throughout the lungs) (www.lungdiseases.about.com/od.pneumon2). Invasion of the lung parenchyma by bacteria produces an inflammatory immune response. This response leads to a filling of the alveolar sacs with exudates. The loss of air space and its replacement with fluid is called consolidation. In bronchypneumonia, or lobular pneumonia, there are multiple foci of isolated, acute consolidation, affecting one or more pulmonary lobes. Pneumonia in cattle, sheep and goats is largely caused by bacterial agents (Ameh and Abdul-Ganiyu, 2003) such as *Pasteurella* spp., *Mycoplasma* spp., *Actinomyces pyogenes*, *Klebsiella* spp., *Actinobacillus lignieresii*, *Bordetella parapertussi*, *Escherichia coli*, *Staphylococcus aureus*, *Fusobacterium necrophorum*, *Neisseria* spp., *Chlamydia* spp. (St George and Sullivan, 1973; Davies, 1985; Cullinane *et al.*, 1987) and *Mycobacterium* spp. (Barton and Acland, 1973). Viral agents implicated in pneumonia include Parainfluenza 3, respiratory syncytial virus, type-3 reovirus (Hore, 1974), Maedi-visna (Hoff-Jorgensen, 1989). Ikede (1978) also reported on pneumonia due to parasitic and mycotic infections. Aspiration pneumonia is also a form that is common in farm animals occurring mostly after careless drenching or passage of stomach tube during illness, fluid feeds in inadequate troughing, inhalation occurring in the struggle for food, vomiting or regurgitation.

Depending on the organism(s) involved, infection may be acute (exudative or proliferative) with death occurring within 36 hours of infection or can progress and become chronic (suppurative or non-suppurative), with widespread permanent lung damage (Pfizer, 2006). Pneumonia is manifested clinically by an increase in the

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respiratory rate, changes in the depth and character of respirations, coughing, abnormal sounds on auscultation (Radostits et al., 1994). Economic losses due to pneumonia comes in the form of morbidity and mortality, including emaciation (Alley, 1987), poor weight gain (St George, 1972), poor meat quality and condemnation of the affected lungs during meat inspection. It was against this backdrop that this study was conducted to determine the prevalence of pneumonia in cattle, sheep and goats in the study area to further define the nature of the problem.

MATERIALS AND METHODS

Source of data

Data on the incidence of pneumonic lungs from cattle, sheep and goats were obtained from the Maiduguri Metropolitan abattoir, Maiduguri, Nigeria, from 2000-2004. The data included the slaughter figures for the various animals in question. Such data were analyzed for annual prevalence and sex distribution of cases.

Diagnosis of pneumonia

Diagnosis was made at postmortem by the veterinarian in charge. Lungs that show lobular congestion or hepatization, serofibrinous or purulent exudates in bronchioles, consolidation and fibrosis, are considered pneumonic. No microbiological assay was carried out.

Statistical analysis

All results were expressed as means \pm standard error of means (SEMs). Comparisons were made with two-way ANOVA test of significance between individual groups. Post test comparisons among individual groups were done using the Bonferroni's multiple comparisons procedure. The test was carried out using the PRIZM software (GraphPad).

RESULTS

Out of a total of 173,824 cattle examined at post-mortem, 54% were males while 46% were females; out of 270,339 goats examined, 52% were males while 48% were females; out of the 125,287 sheep examined, 53% were males while 47% were females. Difference in the slaughter figures between males and females was not significant ($p>0.05$) (Table 1). Overall prevalence of pneumonia in cattle, goats and sheep was 0.21%, 0.09% and 0.12% respectively.

Table 1. The number of cattle, goats and sheep slaughtered in Maiduguri abattoir from 2000 - 2004.

Year	Cattle		Goats		Sheep	
	Male	Female	Male	Female	Male	Female
2000 ^a	6,879	5,696	6,318	6,074	4,927	4,509
2001 ^b	15,592	14,749	15,411	14,154	9,716	6,900
2002	25,540	20,673	47,811	46,129	15,804	14,037
2003	24,254	20,024	49,145	45,531	17,072	15,320
2004	21,945	18,473	20,547	19,221	18,871	18,131
Total	94,210	79,614	139,230	131,109	66,390	58,897

^aJuly report not available; ^bOctober and November reports not available

Highest cases of 133 were recorded for cattle in 2004 while lowest cases (7) occurred in goats in 2004. Prevalence of pneumonic lungs in cattle had a mean occurrence of 70.20 ± 19.16 ; in goats it was 50.60 ± 19.46 while in sheep it was 29.80 ± 8.35 . The prevalence was relatively unstable over the period under review. Overall prevalence rate was highest in cattle and lowest in goats (Table 2), nevertheless, such differences were not significant ($p>0.05$).

DISCUSSION

During the period under review (2000-2004), prevalence rates were 0.21%, 0.09% and 0.12% in cattle, goats and sheep respectively. These prevalence rates were low considering the number of animals slaughtered during the period. The prevalence rates were not significant ($p>0.05$) and sex did not influence the prevalence.

Earlier studies reported a similar trend of lower prevalence of pneumonia in sheep and goats (Ojo, 1976; Japheth, 1989) in Nigeria but higher prevalence was reported by Ramirez and Pijoan (1979) where they recorded

10.1% and 10.4% in sheep and goats, respectively in Mexico. Various reasons were attributed to this trend which includes regional, climatic, topographical as well as management practice (Japheth, 1989). Some of the reasons for the low prevalence are that the animals may be showing sub-clinical infections that are not detected at post-mortem, hiding of pneumonic lungs from meat inspectors and slaughtering of animals outside the abattoirs particularly during festive periods. The use of antibiotics in feed to control bacterial infections in animals may also contribute to the low prevalence of pneumonia.

Table 2. Number of animals showing pneumonic lungs

Year	Pneumonic cases		
	Cattle	Goats	Sheep
2000 ^a	86(0.68)	38(0.37)	26(0.28)
2001 ^b	51(0.13)	51(0.19)	38(0.23)
2002	63(0.14)	123(0.13)	57(0.19)
2003	18(0.00)	34(0.04)	20(0.06)
2004	133(0.33)	70(0.02)	8(0.02)
Total	361(0.21)	253(0.09)	149(0.12)

^aJuly report not available; ^bOctober and November reports not available; (%) figures in parenthesis are the prevalence rates.

Highest prevalence rate was recorded in cattle and this may be due to stress associated with importation of cattle from the neighbouring Chad and Niger Republic. Such long distance journeys predispose these animals to stress, hence they succumb to infections with organisms that are natural inhabitants of the respiratory tract. Sheep and goats are often reared locally forming an integral part of the cultural life of the people and little or no stress is involved during transportations. Stress has been reported to be a principal factor in pneumonic pasteurellosis because studies have shown that *Pasteurella haemolytica* was the major bacterial isolate in pneumonic lungs (Knowles *et al.*, 1995; Ameh and Abdul-Ganiyu, 2003).

In the U.S.A. feedlot, more than \$500 million is spent each year because of bovine respiratory disease complex (Pfizer, 2006). In Nigeria, the economic impact of pneumonia on the economy is yet to be assessed, but field experience has indicated a serious impact. Since pneumonia has been implicated to be the greatest single cause of death, more research into the mechanism of pathogenesis, with regards to aetiology of pneumonia and characterization of novel bacterial isolates need to be carried out for better control/prevention strategies.

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