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### **ABSTRACT**

*A five-year data (1995–1999) on mastitis among slaughtered cattle, sheep and goats collected from the Federal Livestock Department (FLD), Imo State zonal office, was analysed to determine the prevalence of the condition among such animals in Imo State. Of the 8615 female animals handled at veterinary approved slaughter points during the period, 6230 (72.8%), 497(5.8%) and 1848(21.4%) were cows, ewes and does respectively. Mastitis was recorded among 405 (6.6%) of the cows, 77(15.5%) of the ewes and 352(19.1%) of the does. Across four seasons, mastitis was significantly higher (16.5% and 34.4%) among cattle and goats respectively during late dry (LD) season ( $p<0.05$ ) while among the sheep, significantly ( $p<0.05$ ) higher figure (22.0%) was observed during the early rainy (ER) season. Overall monthly prevalence showed lower levels of infection among cattle and goats from April to June and September to December while for sheep, lower infection rates coincided with February to May and November to December periods of the year. Slaughter sheep and goats may reflect higher incidence of mastitis than their counterparts in the field.*

Keywords: Mastitis, Ruminants, Abattoir, Incidence, Nigeria

### **INTRODUCTION**

Mastitis is the inflammation of the mammary gland characterised by pathological and glandular changes usually resulting in reduced milk secretion (Spronle, 1995). Infective and potentially pathogenic bacteria (Egwu et al, 1994; Bezek and Hall, 1995), virus (Speedy, 1992), fungi (Blood and Radostits, 1989) algae (Sukta, 1988) have been implicated as major causes of the condition in all countries producing livestock. Mastitis causes considerable economic loss in the livestock industry as a result of morbidity, mortality, reduced milk production and high treatment costs associated with the condition (Chineme and Addo, 1984; Contrepas et al, 1995).

Several factors such as poor hygiene and high incidence of infectious diseases among others have been shown to predispose ruminant livestock to mastitis (Magic et al, 1993; Barnouin et al, 1995). Based on field studies, moderate incidence of mastitis had earlier been reported among different classes of field ruminant livestock in the different regions of Nigeria (Molokwu and Igono, 1978; Addo et al, 1980; Okolo, 1985; Kawu et al, 1992; Ameh et al, 1993; Aliyu et al, 1994).

Abattoir slaughter records have been found very useful in detecting diseases and syndromes of both economic and public health importance in the developing countries where technological difficulties hinder extensive use of modern diagnostic techniques in disease surveillance and control (Hyera, 1984; Matovelo and Mwamengele, 1993; Okoli, 2001). There are however, limited published reports on the prevalence of diseases encountered in food animals slaughtered in Southeastern Nigeria (Okolo, 1985; Okoli, 2001). A thorough search through existing literature did not reveal any such published work on mastitis among food animals slaughtered in Imo state. Such a study is needed since it will add to the baseline information required in formulating state and national animal disease surveillance and control programmes. The present study therefore reports the result of the analysis of abattoir data on cases of mastitis encountered among cattle, sheep and goats slaughtered in Imo state, Nigeria from 1995 to 1999.

**METHODOLOGY**

The prevalence of mastitis among cattle, sheep goats slaughtered in Imo state, Nigeria was monitored from 1995 to 1999, using meat inspection data collected from the public health unit of the Federal Livestock Department (FLD), Imo state zonal office. State veterinary personnel usually generate such data for the state during their routine meat inspection activities at the officially designated slaughter points at the different local government areas. Data from local government areas are used to build the monthly meat inspection report for the state. These reports are subsequently resubmitted to the FLD zonal office. Available data contained overall yearly and monthly cases of mastitis for the animals. Mastitis is usually diagnosed at the various abattoirs by gross and histopathological examinations.

These data were subjected to descriptive and quantitative analysis with the former involving the use of simple averages, ratios and percentages to determine the prevalence rate and trends across four seasons namely, early dry (ED, October to December), late dry (LD, January to March), early rain (ER, April to June) and late rain (LR, July to September). Yearly and seasonal trends were further subjected to analysis of variance (ANOVA) and where significant differences were observed; means were separated by the Least Significant Difference (LSD) method (Steel and Torrie, 1980).

**RESULTS**

A total of 8615 female animals were slaughtered during the study period (Table 1). This was made up of 6270(72.8%) cows, 497(15.8%) ewes and 1848(21.4%) does. Overall, cases of mastitis were recorded in 835 (9.72%) of the animals.

Table 1: Overall yearly prevalence rates of mastitis in cattle, sheep and goats slaughtered in Imo state (1995-1999)

Period	Cattle		Sheep		Goat		Total	
	No of Cows Slaughtered	No (%) infected	No of Ewes Slaughtered	No (%) infected	No of Does Slaughtered	No (%) infected	No of animals Slaughtered	No (%) infected
1995	1214	24(1.9)	51	18(35.3)	292	101(34.6)	1557	143(9.2)
1996	523	62(11.9)	22	7(31.8)	188	61 (32.5)	733	130(17.7)
1997	250	70(28.0)	27	10(37.0)	134	40 (29.9)	411	120(29.2)
1998	2060	110(5.3)	247	35(14.2)	699	110(15.7)	3006	255(8.5)
1999	2223	140(6.3)	150	7(4.7)	535	40(7.5)	2908	187(6.4)
Total	6270	406(6.5)	497	77(15.5)	1848	352 (19.1)	8615	835(9.7)

Four hundred and six (6.5%) of the 6270 cows, 77(15.5%) of the 497 ewes and 32(19.1%) of the does were mastitic. Across the study period, mastitis was most prevalent in all the species in 1997 with figures standing at 28.0%, 37.0% and 29.9% for cattle, sheep and goats respectively. The lowest figures on the other hand, were recorded in 1999 with rates for cattle, sheep and goats standing at 6.3%, 4.7% and 7.5% respectively. On the whole, incidence of mastitis was higher in 1997(29.2%) and was followed by the 17.7% obtained in 1996 while the 6.4% recorded in 1999 was the least.

Table 2 shows the prevalence of mastitis in the study animals across four seasons. Overall, highest incidence rate (22.2%) was obtained during the LD season and was followed by the 12.2% recorded during LR season while the other two seasons (ED and ER) maintained figures of 6.6% and 6.7% respectively. Among the goats, highest prevalence rate (34.4%) was recorded during LD season while the lowest rate (8.2%) was obtained in ER season. The LD figure was significantly ( $p < 0.05$ ) higher than the others. The 28.7% incidence rate observed

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during the LR season among the sheep was also significantly ( $p < 0.05$ ) different from the figures recorded for the other seasons. Again, the 16.5% prevalence rate encountered among the cattle during the LD season was significantly ( $p < 0.05$ ) higher than figures for the other seasons.

Table 2: Prevalence rates of mastitis across four seasons in cattle, sheep and goats slaughtered in Imo State from 1995 to 1999.

Period	No of cows Slaughtered	No (%) injected	No of Ewes Slaughtered	No (%) injected	No of Does Slaughtered	No (%) injected	Total
ED	2644	98 <sup>b</sup> (3.7)	214	20 <sup>b</sup> (9.3)	493	102 <sup>b</sup> (20.7)	3351 220(6.6)
LD	696	115 <sup>a</sup> (16.5)	82	6 <sup>b</sup> (7.3)	337	116 <sup>a</sup> (34.4)	1115 247(22.2)
ER	1851	101 <sup>b</sup> (5.5)	100	22 <sup>a</sup> (22.0)	573	47 <sup>b</sup> (8.2)	2524 170(6.7)
LR	1079	92 <sup>b</sup> (8.5)	101	29 <sup>a</sup> (28.7)	445	87 <sup>b</sup> (19.6)	1625 198(12.2)
Total	6270	406(6.5)	497	77(15.5)	1848	352(19.1)	8615 835(9.7)
SEM		7.47		4.82		32.88	-

ab means in the same column with different superscript are significantly different ( $p < 0.05$ )

- ED = Early dry season
- LD = Late dry season
- ER = Early rainy season
- LR = Late rainy season
- SEM = Standard Error of Means

Figure 1 shows the overall monthly percentage prevalence of mastitis among cattle, sheep and goats slaughtered in Imo state from 1995 to 1999. Among the cattle, there were peak periods of infection during the months of February to March and August to September with the former showing higher percentage prevalence. Among the sheep on the other hand, 3 peak periods were observed, coinciding with the months of January, June to July and September to October. The highest percentage prevalence (73.9%) was recorded during the month of June. Similarly, three peak periods of infection were observed among the goats. The highest peak of 72.7% was recorded in the month of January and was followed by those of March, and July to August.

Overall, lower levels of infection were observed among the cattle and goats during the months of April to June and September to December while for sheep, lower infection rates occurred during February to March and November to December periods of the year.

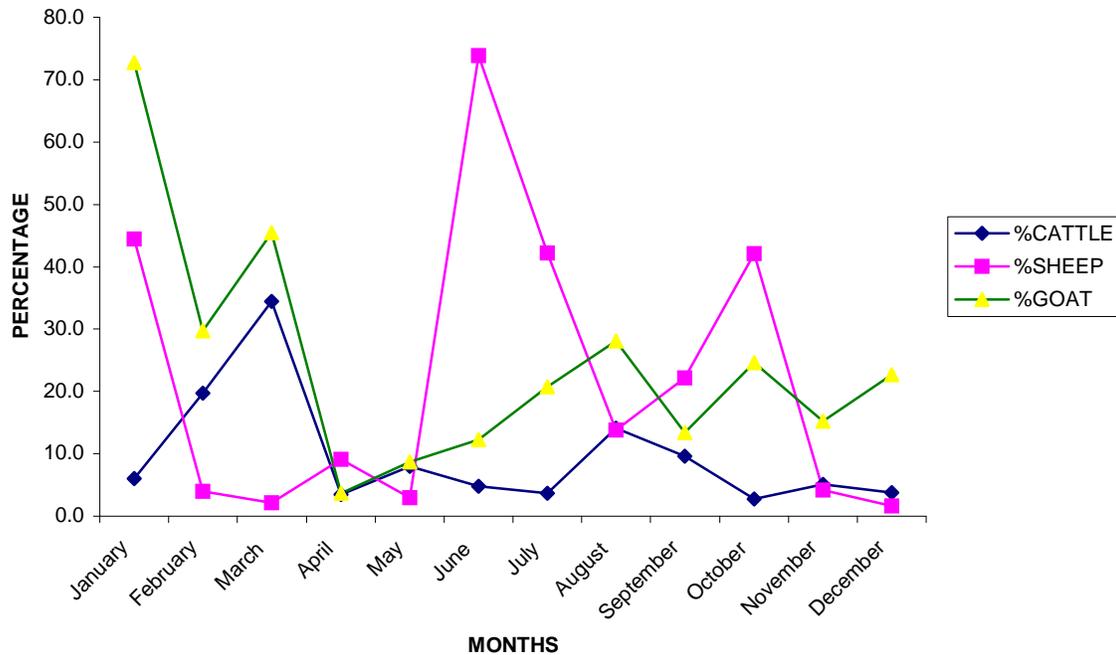


Figure 1: Overall monthly percentage prevalence rate of mastitis among cattle, sheep and goats slaughtered in imo state from 1995 - 1999.

## DISCUSSION

The present study reveals a moderate to high incidence of mastitis among food animals slaughtered in Imo state during the study period. Goats were most prone to the condition, recording an overall incidence rate of 19.1%. This does not agree with the range of 0.6% to 10.9% incidence rates from report of other works from Nigeria on the same specie (Addo et al, 1980; Kawu et al, 1992; Okolo, 1985; Molokwu and Igono, 1978). The stress of transportation and other predisposing factors associated with aggregation of large numbers of animals at slaughter points may have helped to increase the incidence of mastitis among the slaughter animals. A significant number of goats slaughtered in the state originate from the Northern states of the country and are mostly the Savannah brown Madara breed with relatively large udder (Aladi, 1999, Okoli et al, 2002). The high milk yield associated with long lactiferous sinuses in this breed predisposes it to frequent sinus blockage leading to the damming of milk in the udder thus initiating the process of mastitis especially in the presence of a residual infection (Blood and Radostits, 1989). The anatomic predisposition of these breeds of goats to mastitis probably also explains the differences in the prevalence rates recorded in this study between it and the cattle and sheep.

The 15.5% prevalence rate of mastitis among the ewes recorded in the present study is higher than the 1.0% and 4.4% reported by Kawu et al (1992) and Aliyu et al (1999) in Zaria and Maiduguri respectively. The disparity may again be explained by stress of transportation and aggregation of large number of animals that may predispose slaughter animals to higher incidence of mastitis (Okoli, 2001). Furthermore, Aliyu et al (1999) has shown that the major factor predisposing to mastitis among sheep is injury to the udder with up to 72% of the cases being accounted for by this factor in their study. The incidence rate of 6.6% among the cattle recorded in this study is much lower than the range of 21% to 29% reported in other tropical countries with relatively more developed dairy industry (Char et al, 1993; Daljeet et al, 1996;

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Manchial et al, 1999). The fact that most female cattle brought for slaughter in Nigeria are relatively old and dry animals that have passed their reproductive age and are also mostly beef animals (Aladi, 1999; Opara et al, 2002) probably explains the lower figure obtained in the present study. Overall, there was higher incidence of mastitis among all the species during the hotter periods of the year, although among the sheep, there was a single peak period during the month of June. This agrees with earlier reports by Molokwu and Igono (1978) that the peak occurrence of mastitis in cows and does is within the late hot dry to early hot-humid seasons of the year.

### **CONCLUSION**

The present study reveals moderate to high incidence of mastitis among slaughter animals in Imo state, Nigeria with specifically higher incidence of the condition being observed among slaughter goats and sheep than previously reported.

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