

A N ABATTOIR STUDY OF CAPRINE MASTITIS IN ALKALERI LOCAL GOVERNMENT AREA BAUCHI STATE

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ABSTRACT

A study was conducted to investigate the prevalence of mastitis in goat breeds slaughtered at the Alkaleri metropolitan abattoir. A total of 1,916 does of Red sokoto, Kano Brown, Sahelian, West African Dwarf, and their crosses were studied. The result showed that infection rate of mastitis among the breeds were significantly different ($p < 0.05$) values being 53.36, 5.77, 51.24, 50.46, and 28.57% for Red sokoto, Kano Brown, Crosses, Sahel and West African Dwarf goats respectively. The prevalence of mastitis in the three age groups (Young, matured and older does) differed significantly ($p < 0.001$) values being 34.4, 42.9, 68.4 respectively. It is concluded that there

Introduction:

Goats belong to the genus *capra*, they are a major source of animal protein in Nigeria, supplying up to about 108,700 tones of meat (Abubakar & Mselbwala, 2012). Goats supply meat, milk, skin and manure. In Nigeria, Goats are kept mainly as source of meat, with little emphasis on milk production (Okonkwo, 2004). The projected goat population in the country was 42.01 million, while sheep accounts for 26.27 million (ILCA, 2005) RIM (2018) reported that in

is a genotype difference in prevalence of mastitis in the study area, the older does were more susceptible to the disease than the younger and matured ones. It is therefore recommended that goats under the free range extensive system should be given prophylactic treatment against mastitis before attaining puberty and subsequently, lower prevalence rate of this disease could be used as an index for selecting dairy goats.

Key words: Abattoir, Study, Caprine, Mastitis, Alkalari

Sub Saharan Africa, there are more than 142.5 million goats, with Nigeria having up to one quarter of the total population. A survey conducted in the northern Nigeria shows that over 90% of traditional households keep goats or sheep (Otchere *et al*, 2009). It is also reported that in the developed countries, average per capita daily intake of animal protein is estimated at 50 g, while in the developing countries (including Nigeria) it is only between 12-25 or 3 to 4 times less. Also, the average milk consumption per capita per year in the developed countries stands at 200 kg, while in the developing countries 5.5 times lower. In many sub-Saharan African countries, this parameter is extremely low, sometimes less than 10 kg (FAO, 2018). It has been reported that the animal protein supply in the country is estimated at 35% for goats, 112% for cattle, and sheep 35%. Also, the report further indicates that goats can yield up to about 724,390 tones of meat (Sulaiman *et al*, 2007)

In Nigeria, goat milk is rarely used for human consumption; however, the importance of goat milk, there is a growing awareness on the importance of milk consumption world-wide (Park and Chukwu, 2016). Johnson (2000) reported that in Britain and United States of America, there is a growing demand for goat milk for therapeutic use. Goat milk is more widely produced than sheep milk. Globally, goat

production yield 60% of the value as milk, 35% as meat and 5% as skin (martha *et al* 2012) for instance, Webster (2018) reported that countries like Iraq and Libya, obtain half of their total milk requirements from goats.

Statement of problems

Mastitis has been described as one of the common disease condition that prevent effective production of milk in many species of farm animals such as goats, cattle, and sheep (mijinyawa,2006).other causes include lack of enough balanced ration, improper housing and poor management strategy (Ademola,2018).mastitis is a disease complex resulting from interplay between infectious agents and managerial practice, which is characterized by physical, chemical and bacteriological changes in milk, and pathogenic changes in udder tissues (Robert,2016).

There is a paucity of information on the prevalence rate of mastitis especially on the indigenous species of farm animals, for instance in cattle (Nyari *etal*,2004),in goats (Ameh *etal*,2009, Alawa *etal*,2002)and sheep (Egwu and Zaria 2008).

Objectives of the study

This study was therefore conducted to investigate:

- (i) The prevalence rate of mastitis in the indigenous goat breeds (Red sokoto, sahel, Kano Brown, west African Dwarf)
- (ii) The age at which the prevalence rate in the study area is highest.

MATERIAL AND METHOD

Location and climate

The study was conducted in Alkaleri Town, Alkaleri Local Government Area of Bauchi state. Alkaleri town, is located at

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10°58'N10°20'07"E.at an altitude of 695.20 meters above sea level(Wikipedia.org,2021).The mean weather data in Alkali town is shown in Table 1.

Table 1: mean weather data at Alkali town

| Months | Rainfall(mm) | Relative humidity(%) | Temperature (°C) | | sunshine Hours/ |
|-----------|--------------|----------------------|-------------------|------|--------------------|
| | | | Min | max | |
| January | 00 | 26.5 | 15.8 | 30.4 | 7.5 |
| February | 00 | 29.4 | 15.0 | 31.5 | 10.8 |
| March | 00 | 24.6 | 21.5 | 36.7 | 7.2 |
| April | 20.2 | 44.7 | 23.8 | 36.6 | 7.5 |
| May | 54.1 | 56.7 | 24.7 | 35.5 | 7.6 |
| June | 110.4 | 63.4 | 22.5 | 33.5 | 7.8 |
| July | 232.1 | 76.1 | 22.1 | 31.1 | 5.4 |
| August | 217.7 | 80.5 | 20.9 | 30.0 | 5.6 |
| September | 133.7 | 78.5 | 20.9 | 30.4 | 6.2 |
| October | 40.6 | 64.9 | 19.5 | 32.0 | 7.0 |
| November | 00 | 37.8 | 15.9 | 33.6 | 9.9 |
| December | 00 | 31.6 | 13.8 | 31.1 | 9.4 |

Source:(meteorological Department, Federal ministry of Aviation,2019)

Experimental animals

Goats that are slaughtered at the Alkali town abattoir were used for the study. Most of the animals were obtained from small scale farmers that practice the traditional system of management, were animals graze on natural pasture with little or no supplementation.

The Red sokoto goats have been described by kawu(2017) as the most numerous and widely distributed breeds of goats in Nigeria. It is one of the few well defined breeds of goats, and is characterized by

its uniform dark red coat colour, short and horizontal ears, and horns in both sexes. The adults reach the body weight of 25-35k g.

Kano Brown goats are among the few breeds in Nigeria that are not well defined. They are characterized by their uniform light brown coat colour with short and horizontal ears. Both sexes have horns. The yearlings weigh between 10 and 16 kg (kawu, 2017)

The sahelian goats are more common in the sahel region of Nigeria. They are also found outside this region. They are long legged animals and are covered with a coat of short-fine hair, and are highly adapted to nomadic life. They have pendulous ears, with bucks weighing from 25-35 kg, while does have an average weight of 20-25 kg (Abubakar, 2014)

The west African Dwarf goats are breeds of goats that are mostly found in the forest zones of the southern Nigeria, they are also found outside the zone. They have small body size, and are short legged, they have varieties of coat colour, but black and brown colour predominates .It is common for both males and females to have bearded. The breed is rated for its hardiness and tolerance to trypanosomiasis (okonkwo,2013)

A total of 1,916 does of these breeds were randomly selected as they enter the slaughter slabs. Most of the animals were purchased from small scale farmers that practice the traditional system of management, where animals graze on natural pasture with little or no supplementary feeding, provision for housing and medical care are non existent. The previous history of these animals was not known, but they were normally kept for a period of 1-3 days before slaughter. About 120 small ruminants (goats and sheep) are slaughtered every day. Most animals used are brought from surrounding villages, then bought and slaughtered, the owners were stopped at random, request made for their animals to be used for the study. In most cases, they did cooperate. All the animals brought to the abattoir were usually

ear marked for slaughter. The period of the study covered from August 2019 to March 2019.

Data collection

A total of 1,916 females (Red sokoto,847,Kano brown,508, sahelangoats,218, West African Dwarf goats 21, and crosses 322) were randomly sampled as they entered the slaughter slab. The breeds were identified ad aged by the dentition method as described by kawu(2017). Samples were collected post mortem ad were immediately transported ad preserved I test tubes from the abattoir to the laboratory for analysis. Samples were collected every five days throughout the experiment period.

Age determination

The age was determined using the method described by kawu (2017)

12 months: all temporary teeth present

14 months: 2 central permanent incisors

36 months: 2nd pair of permanent incisors

48 months: 3rd pair of premolars

60 months: 4th coner molars

Age group

For this study, the animals were grouped as follows:

Young 0---12 months

Mature 12-24 months

Old Above 24 moths

strip cup method

Milk from each quarter of the udder was poured into a cup and 2 drops of 4% Noah (sodium hydroxide) were added mixed thoroughly with an applicator stick. Presence of flakes were observed I a clean

watery background .Normal milk appears to be homogenous, while infected milk was determined based on the precipitation in the milk.(Robert,2017)

Data Analysis: The data generated from this study were subjected to simple descriptive statistics and chi-square test was also used for relevant parameters (Hamburg, 2012)

RESULTS

Prevalence of mastitis in goat breeds

Data on the prevalence of mastitis in goat breeds are presented in Table 2. The result showed that infection rates among the breeds were significantly different ($P < 0.05$) values being 53.3% (Red sokoto) 51.77 % (kano Brown) 50.46% (sahelian goats) 28.5% (west African Dwarf goats) and 51.24% (crosses)

Prevalence of mastitis in relation to age

The prevalence of mastitis in goats with respect to age is depicted in Table3. The result showed that infection rate regardless of breeds was highly significant ($P < 0.001$). The result also revealed that young goats have a lower prevalence rate (34.4%) followed by matured (42.9%) and older (68.4%)

Table 2: Prevalence of mastitis in goat breeds

| BREEDS | No of Animals affected | No of animals not affected | Total | Rate of infection | X^2 LOS |
|--------------------|------------------------|----------------------------|-------|-------------------|-----------|
| Red sokoto | 452 | 395 | 847 | 53.36(%) | |
| Kano Brown | 263 | 245 | 508 | 51.77(%) | 15.56* |
| Sahelian | 110 | 108 | 218 | 50.46(%) | |
| West African Dwarf | 06 | 15 | 21 | 28.57(%) | |
| Crosses | 163 | 157 | 322 | 51.24(%) | |

*($P < 0.05$)

Table 3: Prevalence of Mastitis in relation to age

| Age | No of Animals affected | No of Animals not affected | Total | Rate of infection | χ^2 | LOS |
|---------|------------------------|----------------------------|-------|-------------------|----------|-------|
| Young | 134 | | 255 | 389 | 34.4% | 152.1 |
| Matured | 306 | | 408 | 714 | 42.9% | *** |
| Old | 556 | | 257 | 813 | 68.4% | |

*** ($p < 0.01$)

DISCUSSION

Prevalence of mastitis in goat breeds

The prevalence rate obtained in this study was much higher than the value of 16.04% and 9.4% reported by Yunusa *et al* (2004) and is similar to the values reported by Alawa *et al* (2013) who reported an infection rate of 30.3% for goats with unilateral enlargement, and 31.6% for goats with bilateral enlargement of the udder tissue in their study of different breeds of goats. It is also in agreement with the findings of Ameh *et al* (2017) who reported an infection rate of 23.97% for goats with bilateral infection and 76.1% had only one affected udder.

The existence of observed significant difference ($P < 0.05$) in this study could be partly due to genotype and partly attributed to the difference in management practice, where majority of the animals studied are kept under the traditional system of management, with little or no provision for medication. For instance, the West African Dwarf, which is a forest breed, has the lowest infection rate (28.5%) than the other breed which are predominantly inhabitants of the savannah zone. This implies that the ecological niche of an animal may play a role in the distribution of the disease.

The high prevalence rate could also be associated with the high milk yield potentials of these breeds as reported by Buraima *et al* (2018) and the significant difference among the breeds in terms of milk yield,

Alhassan and kolade(2018) reported that the Red sokoto and Kano Brown goats and their crosses are relatively high milk yielders. The prevalence rate for young goats (34.4%),matured goats(42.9%) and older goats(68.4%) obtained in this study is in conformity with the findings of olufemi (2017) who reported an infection rate of 80.18 % in older cows Dasgupta *et al*(2015) reported an infection rate of (48.7%) in older goats, and (31.3%) in matured goats while the younger goats had only(20.0%).

Conclusion and Recommendation

The prevalence rate of mastitis in goat breeds showed breed difference, and the disease is more prominent in the older does than the younger ones. It is therefore recommended that goats under extensive system of management should be given prophylactic treatment against mastitis before attaining puberty and subsequently. Also, the breed that has the lowest prevalence could be used as an index for selecting dairy goats.

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