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FREQUENCIES OF MORTALITY IN RED SOKOTO GOATS

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Abstract: Frequencies of mortality in Red Sokoto goats were estimated using 1,798 records generated from goats raised under semi-intensive system of management at the National Animal Production Research Institute (NAPRI), Shika-Zaria, Nigeria. The data were analyzed using chi square procedure of SAS. Greater proportion (55%) of the total mortalities occurred in breeding season 1 (January-June). Post-natal mortality (83.75%) was more frequent than both of peri-natal (Stillbirth, 8.96%) and pre-natal (Abortion, 7.29%) mortalities. In addition, post-natal mortality was high (83.83%) during the pre-weaning period. Although there was no significant difference in mortality based on the sex of kids, higher litter size caused (P<0.05) more mortality in the herd. It is recommended that selection practices in the herd should be limited to twin births.

Keywords: Red Sokoto Goats, mortalities, litter size, sex

Introduction

Mothering ability is a complex feature that is closely associated with the survival of kids and it was reported (Dalton, 1981) that it could greatly affect does ability to feed, shelter and perhaps protect the kid from predators. Chowdhury *et al*. (2002) stated that kid mortality is as a result of many interacting factors. In tropical conditions, mortality varies according to the viability of the new born kids - birth weight and adaptability to post-natal period (Morand-Fehr *et al*., 1984), nutritional level of the does or to their milk yield (Hussain *et al*., 1995), litter size (Van Niekerk and Pimentel, 2004) and to disease constraints (Alexandre *et al*., 2001).

High level of kid mortality represents a significant barrier to increased productivity in goat rearing and also reduces the efficiency of production in all types of production enterprises (Sherman, 1987). This study is therefore focused on evaluation of conditions responsible for mortality in Red Sokoto goats at the NAPRI.

Materials and Methods

This study was conducted at NAPRI, Ahmadu Bello University, Zaria. All the 1,798 records used for this study were collected from the Red Sokoto goats. Management practices in the herd had been described elsewhere (Iyiola-Tunji, 2007). Mortalities were considered before parturition (pre-natal mortality – abortion), during parturition (peri-natal mortality – stillbirth) and after birth (post-natal mortality – death after birth). Post-natal mortality was further divided into those that occurred within the first three months of age (pre-weaning mortality – PREWM) and those that occurred thereafter (post-weaning mortality – PSTWM). Breeding season 1 entails the period between January and June while breeding season 2 connotes that of between July to December.

Chi-square procedure of SAS (1998) was used to test the significance differences between frequencies of mortality based on season of birth and physiological states of the animals when the mortality occurred. Similarly, the effect of litter type and sex of goat kids on mortality were established using Chi-squares. The expected values for the effects of litter type on mortality was derived from the average (33.5%) of the range specified by FMEST (1984), while the average (23.52%) of mortality rates of male and female goats (Khan *et al*., 1978) was used to test the goodness of fit for effect of sex on mortality in the herd.

Result and Discussion

The total number of mortalities recorded during the period under this study was 480 (Table 1), which accounted for 26.7% of the total kids in the herd. This is within the range recorded for South African Milk goats (Dokin and Boyazoglu, 2004); goats maintained under semi-migratory management system (Bhat *et al*., 1996) and goats that are between day old to one year of age (Pagot, 1983). The rate is also lower than 38.6% recorded for West African Dwarf goats (Osuagwuh and Akpokodje, 1984).

The percent post-natal mortality was 83.75%, while 7.29 and 8.96% were pre-natal and peri-natal, respectively. Incidence of post-natal mortality occurring during the first 3 months of age (pre-weaning) accounted for 83.83% while 10.44% occurred after weaning. Similar results had been recorded for Red Sokoto goats (Adu *et al*., 1979; Ojo, 1994); West African Dwarf goats (Osuagwuh and Akpokodje, 1984; Ngere *et al*., 1979). Neonatal deaths had been described by Pagot (1993) to always take a higher proportion of total mortality, and it had been said to be caused by cold, lack of nourishment, diseases, as well as by dystocia.

Season of birth was a significant factor (P<0.05) that influenced mortality in this study. Season 1, which had lower percentage of rainfall recorded higher percentage (55%) of pre-natal, peri-natal and post-natal mortality. Adu *et al*. (1979) had earlier recorded similar trends on the same breed of goats. Lower rates of mortality during the season 2 can be attributed to higher nutrition plane (especially from fresh forages), which ensured that does received more nutrients some weeks before and after kidding.

Table 1: Mortality rates in red Sokoto goats

	% Post-Natal Mortality (Dead)	% Peri-Natal Mortality (Stillbirth)	% Pre-Natal Mortality (Aborted)	Total
Season of birth				
January – June	**44.58** [a] (214)	**6.67** [a] (32)	**3.75** [a] (18)	**55.0** (264)
July – December	**39.17** [b] (182)	**2.29** [b] **(11)**	**3.54** [b] (17)	**45.0** (216)
Total	**83.75** (402)	**8.96** (43)	**7.29** (35)	**100** (480)
Physiological state				
PREWM	**83.83** [a] (337)	-	-	-
PSTWM	**10.44** [b] (42)	-	-	-

[ab]Within column and parameter, means with different superscripts are significantly different (χ^2 = 7.238; P < 0.05). Figures in Parentheses are the total number of goats in the specified parameter. PREWM = Pre-Weaning mortality. PSTWM = Post-weaning mortality

Using the average of the range of mortality (27-40%) as expected value, the post-natal mortality record revealed a significant (P<0.01) relationship with type of birth. The mortality rate followed an increasing trend as the number of litter increases (Table 2). It was shown (Table 2) that type of birth of kids was not the cause of peri-natal mortality. This observation showed a tremendously higher disparity from the report of Adebambo *et al*. (1994) on West African Dwarf goats.

The very high rates of mortality recorded in this study for multiple births could have been as a result of the relatively lower birth weights of kids born as triplets and quadruplets. Miah *et al*. (2003) had reported a 10% reduction in mortality rate when birth weight was increased by 2.0 to 3.0 kg in Black Bengal goats. Milk availability to kids, which is an important part of mothering ability, could as well have played a part in the high rates of mortality for multiple births in this study. On the basis of the assumption of similar milk production among does in the herd, the quantity of milk that a single born kid received from the dam (as expected) would have been higher than that of quadruplets. Does have only two teats, which can be engaged conveniently by only two kids at a time at the expense of extra one or two kids from triplets and quadruplets, respectively.

Table 2: Effects of litter type and sex on mortality in Red Sokoto goats

	N	% Post-natal mortality (Dead[#])	% Peri-natal mortality (Stillbirth[Φ])
Litter type			
Single	**625**	**15.84**[a] (99)	**1.23** (8)
Twins	**967**	**23.16**[b] (224)	**2.28** (22)
Triplets	**156**	**39.1**[c] (61)	**1.28** (2)
Quadruplets	**8**	**75.0**[d] (6)	
Sex[Ж]			
Male	**861**	**22.53** (194)	
Female	**809**	**22.37** (181)	

[abcd]Within column and subset, means with different superscripts are significantly different (P < 0.05). Parameters whose values are without superscript are not significantly different (P>0.05). Figures in Parentheses are the total number of goats in the specified parameter. N = Number of goats in specified parameters. [#] χ^2 = 64.85, 3 degree of freedom, P<0.01; [Φ] χ^2 = 2.203, 2 degree of freedom, P>0.05; [Ж] χ^2 = 2.203, 2 degree of freedom, P>0.05

Table 2 also shows a non-significant effect of sex on mortality rate in kids, which is in agreement with the work of Bhat *et al*. (1996); but in contrast with the reports of Khan *et al*. (1978), Adu *et al*. (1979), Osuagwuh and Akpokodje (1984). Male and female kids in this study showed similar rates of survival, irrespective of their weight differences at birth and subsequent weight gains. It is recommended that breeding of goats should be planned to fall towards the end of each breeding year, that is, around December to encourage kidding in May at the beginning of rainfall and weaning in July when the rainfall is towards the peak.

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