

Periparturient behaviour of the West African Dwarf goat

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SUMMARY

The periparturient behaviour of 63 pregnant does and their kids was studied. The behavioural characteristics investigated were incidence of prepartum isolation and restlessness, time taken for new born kids to stand and to start sucking. Apart from these behavioural parameters, the time of parturition, duration of labour, and duration of grooming were also investigated. The results were analyzed for the effects of parity of dam and type of birth on these characteristics. All the does showed prepartum restlessness and about 90 per cent of them actively isolated themselves. Most parturitions (82.5 per cent) occurred during daytime. Labour on the average lasted for about 10 min. On the average, it took kids about 13 min after birth to stand up and an additional 2 min to start sucking. Parity of the dam and the type of birth did not significantly affect any of the characteristics studied.

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Introduction

The West African Dwarf goat is a small, compact animal with a remarkable ability to survive under unfavourable conditions (Oppong, 1965). It is reared in almost every village in Ghana and other West African countries. One area of goat production, and indeed in livestock production in general, that has not received much attention in sub-Saharan Africa is the periparturient behaviour of the dam and its effect on the survival of her offspring. The few studies that have been undertaken have been on sheep.

RÉSUMÉ

AWOTWI, E. K., AGBODZA, S., OPPONG-ANANE, K. & FIANU, F. K.: *Le comportement périparturient de la chèvre naine de l'Afrique de l'Ouest.* Une étude était faite du comportement périparturient de 63 biches gravides et leurs chevreaux. Les paramètres évalués étaient l'incidence d'isolation prépartum et l'agitation, le temps pris par les chevreaux nouveaux-nés de se tenir debout et de se mettre à téter. En dehors de ces paramètres de comportement, le temps de parturition, la durée d'accouchement et la durée de faire la toilette étaient également étudiés. Les données étaient analysées pour les effets de parité de la mère, l'espèce d'accouchement sur ces paramètres. Toutes les biches faisaient preuve d'agitation et environ 90 pour cent d'elles s'isolaient activement. La plupart de parturitions (82.5 pour cent) avaient lieu au cours de la journée. L'accouchement en moyenne durait environ 10 min. En moyenne, les chevreaux prenaient 13 min après l'accouchement de se tenir debout et 2 min de plus de se mettre à téter. La parité de la mère et l'espèce d'accouchement n'avaient pas influencé considérablement aucun des paramètres étudiés.

In mammals, the behaviour of the dam before and after parturition greatly affects the survival of the young. Studies have shown, for instance, that feral goats isolate themselves for about 2 days before parturition and select a comfortable site that will shelter the young from inclement weather and predators (Allan, Holst & Hinch, 1991b). This is essential because goats are more often 'hidiers' and tend to find comfortable sites where their kids can be safe throughout the perinatal period. Good-mothering ability is essential for the survival of the neonate, because the dam is the sole source

of food for the pre-weaned young. To survive, therefore, the neonate must quickly approach its mother and gain access to a teat. This early sucking ensures that the neonate is protected against environmental antigens by a supply of maternal immunoglobulins through colostrum (Klobasa, Werhahn & Kallweit, 1986). The initial sucking by the neonate is also important for the establishment of a bond with the mother (Keverne, 1988).

This work aimed at studying the behaviour of the doe and its kid during the periparturient period.

Materials and methods

Experimental site and animals

The study was carried out at the Ghana National Goat Breeding Station of the Ministry of Food and Agriculture at Kintampo. Animals are kept at night in large sheds with slatted floors at the station. They are sent out for grazing in paddocked pastures at about 10.00 h and brought back to the sheds at about 15.00 h. During the last trimester, pregnant does are kept together as a flock. The does used in the study were bred in April 1997 and started kidding in August 1997. A total of 63 does was used for the study; 22 were primiparous and 41 were multiparous.

Recorded parameters

The five parameters recorded are described as follows:

(1) *Preparturient behaviour.* The does were continuously observed during the day at pasture and during the night in illuminated sheds when signs of parturition were evident. These signs were sunken flanks, fully distended udders, and frequent, high-pitched bleats. The does were observed for incidence of prepartum isolation and restlessness. A doe was judged to have isolated itself from flock mates if it maintained a distance of at least 10 m between itself and the closest member of the main flock until it kidded.

(2) *Time of parturition.* This was recorded as the time that expulsion of the kid began. The time

of parturition was classified as either during the day (6.00 - 17.59 h) or night (18.00 - 5.59 h).

(3) *Duration of labour.* This was calculated as the time interval between the onset of straining and the complete expulsion of the kid.

(4) *Duration of grooming.* This was calculated as the time interval between the onset of the licking of foetal membranes from the neonate by the doe immediately after parturition, and the time of completion of licking. The number of does that consumed the afterbirth was also recorded.

(5) *Time taken for kids to get up and to start sucking.* The exact time, post-partum, for the newly born kid to get up and stand on its four legs, and the time it took it to start sucking were recorded.

Statistical analysis

The results were analyzed by means of the *t*-test (2 tail) and chi-square procedures to test whether the parity of the dam and the type of birth had any significant effects on the aforementioned parameters.

Results

Out of the 63 pregnant does that were observed, 57 (90.5 per cent) isolated themselves from flock mates about 4 h before parturition (Table 1). All the does showed some form of restlessness which was manifested by constant movements, frequent urination, and frequent emission of high-pitched bleats. The parity of the doe and the number of foetuses carried did not affect these prepartum behaviours.

Out of the 63 does that kidded, 52 (82.5 per cent) kidded during the day while only 11 (17.5 per cent) kidded during the night (Table 1). This pattern was unaffected by the parity of the doe and the number of foetuses carried.

On the average, labour lasted for 10.0 min. The duration of labour in single and twin births were 8.4 and 15.0 min, respectively (Table 2). The duration of labour in primiparous and multiparous does were not statistically different ($P > 0.05$).

TABLE 1

The Effect of Parity and Type of Pregnancy on the Prepartum Behaviour and Time of Birth in West African Dwarf Goats

Group of animals	Total number of dams	Prepartum behaviour		Time of parturition	
		Isolation No. (%)	Restlessness No. (%)	Day (6.00-5.59) No. (%)	Night (6.00-5.59) No. (%)
<i>Parity</i>					
Primiparous	22	18(81.8)	22(100)	16(72.7)	6(27.3)
Multiparous	41	39(95.1)	41(100)	36(87.8)	5(12.2)
<i>Number of foetuses carried</i>					
Singles	44	40(90.9)	44(100)	36(81.8)	8(18.2)
Twins	19	17(89.5)	19(100)	16(84.2)	3(15.8)

TABLE 2

The Effect of Parity and Type of Birth on the Duration of Labour and Grooming and Consumption Afterbirth

Group of animals	Total number of dams	Duration of labour (min) (Means \pm SD)	Duration of grooming (Means \pm SD)	Number (%) of does that consumed afterbirth
<i>Parity</i>				
Primiparous	22	10.9 \pm 5.7*	8.5 \pm 3.4*	20(90.9)
Multiparous	41	9.0 \pm 5.1*	10.9 \pm 3.0*	41(100)
<i>Type of birth</i>				
Singles	44	8.4 \pm 5.9*	8.5 \pm 3.1*	42(95.5)
First-born twin	19	15.0 \pm 5.3*	8.5 \pm 3.1*	17(89.5)
Second-born twin	19		8.0 \pm 2.8*	

Means within columns with the same superscript are not significantly different ($P > 0.05$)

On the average, a newborn kid was groomed for 9.6 min. Although multiparous does spent, on the average, a slightly longer time than primiparous does in grooming their kids, this difference was not statistically significant ($P > 0.05$). Does with twins spent about the same time in grooming each kid (Table 2). Afterbirth was consumed by 95 per cent of all the does that kidded. Grooming always started from the head and progressed towards the rest of the body.

Newborn kids, on the average, took 13.2 min after birth to get up and 15.1 min after birth to start sucking (Table 3). The type of birth did not affect either the time it took the kids to stand up or to

start sucking. Sucking was invariably done in the "parallel" direction, with the dam arching her back and parting her legs as the kid sucked facing the teats.

Discussion

The high incidence of prepartum isolation and restlessness observed in West African Dwarf goats agrees with the results reported by other workers. Female feral goats in Australia, for instance, isolate themselves for about 2 days at parturition (O'Brien, 1984; Allan *et al.*, 1991b). This prepartum isolation has even been observed in domestic goats when the space available for

TABLE 3

The Effect of Type of Birth on Birthweight and the Time Taken for Newborn Kids to Get Up and to Start Sucking (Mean \pm SD)

<i>Group of kids</i>	<i>Number of animals</i>	<i>Birthweight</i>	<i>Time taken for kids to get up (Min. post-partum)</i>	<i>Time taken for kids to start sucking (Min. post-partum)</i>
Singles	44	1.21 \pm 0.16	12.9 \pm 4.5 ^a	14.3 \pm 6.6 ^a
First-born twin	19	1.07 \pm 0.17	13.8 \pm 7.3 ^a	15.7 \pm 6.2 ^a
Second-born twin	19	1.02 \pm 0.17	13.3 \pm 4.7 ^a	16.4 \pm 9.2 ^a
All kids	82	1.13 \pm 0.16	13.2 \pm 5.2	15.1 \pm 7.1

Means within columns with the same superscript are not significantly different ($P > 0.05$)

the whole herd is limited (Lickliter, 1984). The goats used in this study were kept in large paddocks during most of the day and in large sheds during the night. They, therefore, had ample space within which to isolate themselves from flock mates. Parturient isolation has also been observed in ewes, though the results have been inconsistent. For instance, while parturient isolation has been observed in more than half of Merino sheep giving birth (Arnold & Morgan, 1975), and in Djallonke \times Sahel crossbred ewes (Tuah, Oppong-Anane & Owusu-Aduomi, 1990a), studies by Stevens, Alexander & Lynch (1981) indicated that most parturient Merino sheep did not actively seek isolation.

Nowak (1989) has suggested that the method used to determine ewe isolation may be too subjective to ensure consistent results, and that factors such as paddock size, stocking rate, available vegetation cover, and the definition of the term isolation may be the cause for the wide variation in reports. Parturient isolation is important in facilitating the formation of an exclusive bond between mother and newborn. It has been shown in sheep that when birth takes place in the presence of other parturient ewes, aberrations in bond formation are common (Kilgour, 1972; Alexander, Stevens & Bradley, 1983).

Most of the does (82.5 per cent) kidded during the day. This finding agrees with that of Allan, Holst & Hinch (1991a) who also observed that only 30 per cent of Australian bush goats kidded

during the night. Many studies have shown that there is apparently no consistent peak for time of births in sheep (George, 1969; Sharafeldin, Ragab & Kandeel, 1971).

Labour in the West African Dwarf goat lasted, on the average, for about 10 min. This is similar to the 13.3 min recorded for Australian bush goats by Allan *et al.* (1991a). According to Lent (1974), normal delivery in most ungulates rarely lasts for more than 1-2 h. Studies in sheep have shown that the duration of birth varies from a few minutes to more than 3h in difficult births (Arnold & Morgan, 1975; Alexander *et al.*, 1989). In this study, parity did not affect the duration of labour. This is in contrast to the findings of Lynch, Hinch & Adams (1992) who reported a slightly longer labour in primiparous ewes and attributed this to the smaller size of the birth canal compared to the size of the foetus. The lack of effect of parity on the duration of labour in this study could have been due to the very small size of newborn kids. On the average, a newborn kid weighed only 1.13 kg. This implied that the fetopelvic proportion in the primiparous does was not significantly different from that of multiparous does; hence, duration of labour was not longer in primiparous animals.

Several functions of grooming have been postulated, including stimulation of respiration, muscle tone, circulation and excretion, removal of birth odours to avoid attracting predators, drying to reduce heat loss, hair care to increase thermal insulation, and bonding and learning of offspring

odour by the mother (Edwards & Brooms, 1982; Nowak, 1989). In goats, it has been suggested that kids are labelled by the doe during the grooming period (Gubernick, 1980, 1981). On the average, immediate post-partum grooming of kids in this study lasted for about only 10 min. This is far less than that reported for ewes. For instance, Alexander *et al.* (1989) have reported that in Merino ewes the duration of grooming increases with litter size from an average of 86 min with singles through 97 min with twins to 129 min with triplets. But Tuah *et al.* (1990a) reported a grooming time of 34.5 min for maiden ewes and 20.6 min for older ewes. The shorter duration of grooming of kids may be because goats are "hidiers" and leave their kids in a "safe" place soon after birth and search for food, returning occasionally to suckle them. In contrast, ewes continue grooming the lambs till they are completely dry and strong enough to follow the dams.

The results of studies on the effect of parity of the dam on the duration of grooming have been inconsistent. Selman, McEwan & Fisher (1970) reported that in cattle the duration of grooming was longer for cows than heifers, while Tuah *et al.* (1990a) reported a longer duration of grooming for maiden ewes. In this study, parity of the dam had no significant effect on the duration of grooming. Others have reported that grooming of lambs can be delayed by maiden ewes (Alexander, 1960; Poindron & Le Neindre, 1980) or by ewes that have experienced difficult birth (Arnold & Morgan, 1975). This study lacked difficult births which may account for the immediate grooming of kids by primiparous and multiparous does. According to Holmes (1976), the amount of grooming of individual lambs is less for multiples than for singles, and is reduced for lambs born later in a litter. The results of this study disagree with this. First-born and second-born of twins were each groomed for about the same time as single-born kids.

Most does (95 per cent) consumed the afterbirth, a phenomenon referred to as

placentophagy which has been observed in other ruminants (Arnold & Morgan, 1975; George & Barger, 1974).

The newborn kids, on the average, took 13 min post-partum to stand and an additional 2 min to start sucking. These times were shorter than those recorded for other breeds of goats. For instance, in studies in Saanen goats, Stephens & Linzell (1974) observed that the time from birth to first-standing varied from 19 to 20.3 min while Allan *et al.* (1991a) reported that kids of Australian bush goats on the average took 20.2 min to stand and 50.8 min to start sucking. The standing time for kids was shorter than the mean time of 20 min reported by Tuah *et al.* (1990b) for lambs. This may be because lambs are groomed for a longer time and this delays their getting up. Arnold & Morgan (1975) showed that 60 to 80 per cent of lambs started sucking within an hour of birth. This early post-partum sucking is crucial, since it affords the neonate the opportunity to acquire adequate amounts of maternal antibodies in colostrum.

Conclusion

Most does isolated themselves about 4 h before parturition which usually occurred during the day. The duration of grooming kids by does was shorter than reported for ewes and their lambs. This may be because goats are "hidiers" and leave their kids soon after parturition, returning only occasionally to suckle them. The bonding between mother and young may, therefore, not be as strong as that in sheep where the kid may not obtain all the antibodies available to it through the mother's milk. Does should, therefore, be confined to their kids and prevented from leaving them soon after parturition, so that a stronger mother-young bond can be established to give the kid access to maximum supply of antibodies in colostrum.

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