VARIATION OF SUPERNUMERARY TEATS AND THEIR ASSOCIATION WITH AGE AND PARITY OF WEST AFRICAN DWARF GOATS

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ABSTRACT
This study was conducted to evaluate the occurrence of supernumerary teats (SNT) and their association with non-genetic factors (age and parity) in West African Dwarf (WAD) goats. A total of 150 lactating does were randomly sampled from households. Data on age, teat number and parity (primiparous or multiparous) of the goats were collected. These data were analysed using descriptive (frequency) and inferential (Chi-square) statistics. The results revealed that 78.6% of the goats had two teats, while 21.4% exhibited SNT, with 12.7% possessing three teats and 8.7% having four teats. While multiparous goats had a higher proportion of SNT than primiparous goats, there was no significant association (p>0.05) between teat number and parity. Similarly, no significant association (p>0.05) was found between teat number and age, although goats within the 1.6–2-year age range had the highest occurrence of SNT. In conclusion, the study found a relatively low frequency of SNT in WAD goats, with no significant relationship between teat number, age, and parity. The occurrence of supernumerary teats were low compared to proportions of goats with two functional teats. There was also no significant association between teat numbers, age and parity of WAD goats.
Keywords: Age, Lactating, teat, Parity, Supernumerary

INTRODUCTION

West African dwarf (WAD) goat is the most numerous in the humid south western part of Nigeria, a large population of which is under extensive management system, reared primarily for meat purpose. In mammals including goats, teat projects from udder and the number of teats varies by mammalian species and often corresponds to the average litter size for that animal (Blackburn, 2017). In mammalian species, the number of functional teats and litter size behavior correlate positively (Kapell *et al*., 2011). If the litter size exceeds the number of functional teats (insufficient number of teats), the nutrient supply in the time before weaning should cover the needs of all the kids (Bidanel *et al*., 2008). Udder and teat characteristics have been shown to be influenced by several factors such as genotype, breeding and management systems (Milerski *et al*., 2006; Abu *et al*., 2013).

In goats, there are two primary teats, therefore, additional teat in excess of this number is known as supernumerary teat (SNT) or hyperthelia. The SNT is a congenital condition associated with combination of some genes with incidence as high as 100% in recessive homozygous genes (*Brka et al*., 2002). The main teat, being bigger and conspicuous is quite distinguishable from the SNT. Age and parity of goats has been reported to have effects on udder characteristics of goats and may be more of a limiting factor to yield in first lactation than in later ones (Sam *et al*., 2017). Therefore, it would be of particular interest to study the variation in SNT in goats and its association with some non-genetic factors. Thus, the study sought to evaluate non-genetic factors (such as age and parity) of SNT in WAD goats

MATERIALS AND METHODS

Location of the study

The study was conducted in households raising goats in Oyo and Ogun states.

Number of animals sampled

A total number of 150 lactating does of WAD goats were randomly sampled for the study. All the individual animals sampled were considered as a subpopulation of the WAD goat population.

Data collection

Data were collected on teat number, parity (Primiparous and Multiparous) and age of the goats which ranged between 1-7 years. Age of the goats were estimated using their dentition as described by a checklist for phenotypic characterization of sheep and goats by FAO (2012).

Data analysis

Data were subjected to descriptive statistics to summarize and show the proportion of goats with certain number of teats inferential statistics – Chi square (for association study between the teat numbers and other factors). To confirm whether the dataset follows a normal (Gaussian) distribution Shapiro-Wilk test was employed. The data were analysed using SPSS (2013).

RESULTS AND DISCUSSION

The results revealed that most of the goats sampled possessed two teats (78.6%) followed by those with three teats (12.7%) while 8.7% of the goats had four teats (Fig. 1). The proportion of incidence of SNT (21.4%) reported in this study is higher than the proportion reported in similar earlier studies for WAD by Akpat *et al.* (2010) and Raheem and Leigh (2014) who reported 15% and 16.4% respectively. Occurrence of supernumerary teats could be attributed to the presence of a recessive mutant allele which presents this characteristic feature in the homozygous state (Odubote 1994). According to (Adebayo and Chineke 2011) the extra teats were considered to be congenital in nature

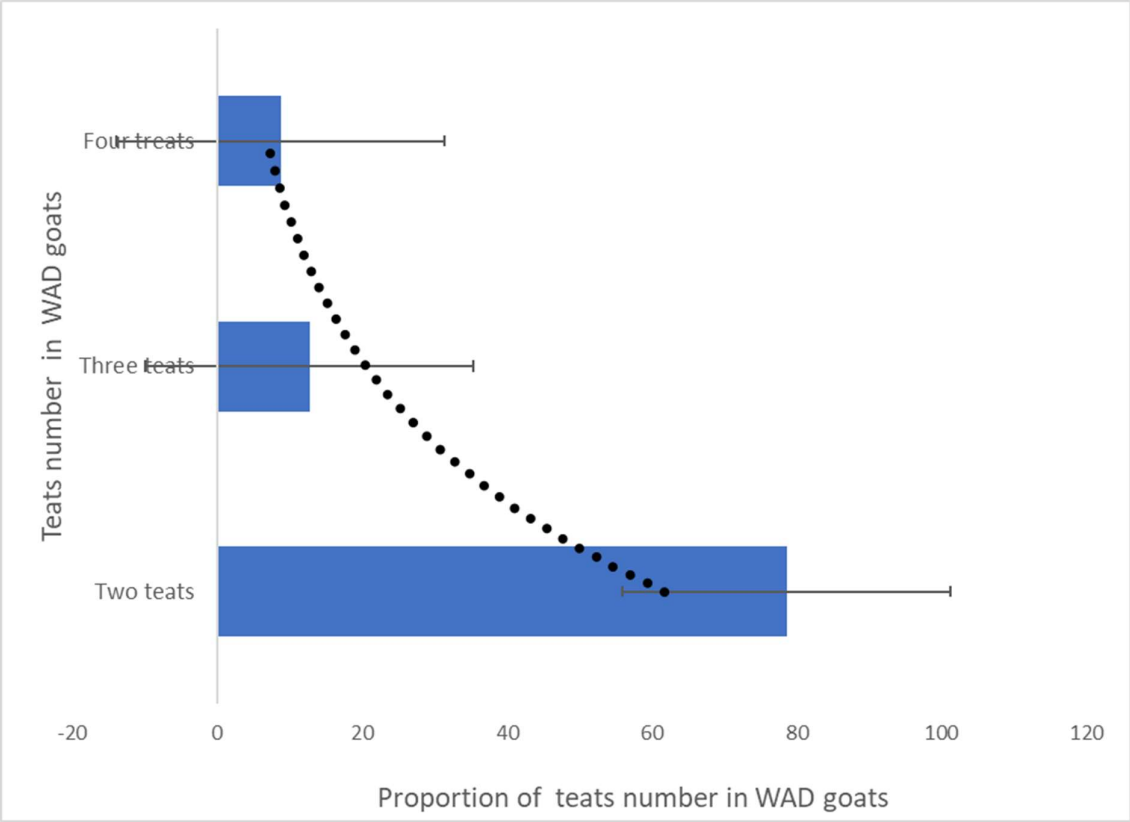

Fig. 1. Frequency of teat number in the WAD goats

The association between teat number and parity of West African Dwarf goats is presented in Table 1. The result shows that most of the goats with two teats are primiparous (15.33%) and multiparous (63.33%). However, they were more of multiparous. There were more of goats with 3 (12%) and 4 (7.33%) teats being multiparous than primiparous. The result further revealed that there was no significant association (p>0,05) between supernumerary and parity of goats. In a similar study on sow; Obermier et al., (2023) reported no significant difference in total teat number and parity groups. However, parity two sows had greater functional teat number when compared to parity 6 sows and lower nonfunctional teat number when compared to parity 6 sows. In goats, includding WAD, the two primary teats ate the functional teats, while the SNT which are usually non-functional remain present across parities but do not necessarily affect milk yield or kid survival.

Table 1. Association between teat number and parity of West African Dwarf goats

Parity / Number of teats	Primiparous		Multiparous		$\chi 2$	*p-value*
Teats number	**Frequency**	**Percentage**	**Frequency**	**Percentage**		
2	23	15.33	95	63.33		
						0.309^{ns}
3	1	0.67	18	12.00	2.350	
4	2	1.33	11	7.33		

χ^2 - Chi - square; ns – not significant at p>0.05

Table 2 shows the association between teat number and age of West African Dwarf goats. The result shows that most of the goats with two teats were found across all the age groups with goats within the age range of 1.6-2 years recording highest proportion (49.33%), followed by goats that were between age range of 1-1.5 years (14.67%) while the least was obtained in goat that were older than 3 years (4%). No observation was obtained for goats with 3 and 4 teats that were older than 3 years. No significant association (p>0.05) was obtained between age and teat numbers of WAD goats. Teat number is fixed at birth and does not change with age. Although the number of teats remains unchanged, their size, shape, and functionality may change with age (Marshall *et al.,* 2024).

Table 2: Association between teat number and age of West African Dwarf goats

Age / Number of teats	1 – 1.5 years		1.6 – 2 years		2.1 – 3 years		> 3 years		$\chi 2$	*p-value*
Teat number	**Freq**	**(%)**	**Freq**	**(%)**	**Freq**	**(%)**	**Freq**	**(%)**		
2	22	14.67	74	49.33	16	10.67	6	4.00		
3	2	1.33	13	8.67	4	2.67	0	0	3.635	0.726^{ns}
4	3	2.00	9	6.00	1	0.67	0	0		

χ^2 - Chi - square; ns – not significant at p>0.05

CONCLUSION

The incidence of supernumerary teats was low compared to proportions of goats with two primary, functional teats. There was also no significant association between teat numbers, age and parity of WAD goats

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