INFLUENCE OF FEED ON DAM PERFORMANCE AND POSTPARTUM IMPACT ON KIDS GROWTH PERFORMANCE AT THE FEDERAL POLYTECHNIC BALI TARABA STATE

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ABSTRACT
This study was conducted to evaluate the influence of feed on the performance of WAD and Sahel doe goats during postpartum and its impact on kids growth rate. Twenty-four (24) pregnant does were used for the experiment. The dams were randomly distributed into four treatments and were fed twice daily in the morning and evening at 0800 h and 17:00 h respectively. Weight (kg) and linear measurement (cm) of the dams and kids were taken on weekly basis Weights of kids were taken 8hrs after birth, while weighing of dams commenced 20 days postpartum. All the variables observed had significant ($P<0.01$) influence on postpartum weight gain of does. In conclusion postpartum weight gain and other body measurements had considerable differences with all the variables.
Keywords: Dam performance, Growth performance, maternal nutrition, Pre-weaning, feeding regiment.

INTRODUCTION
Livestock production and research in Africa have been geared towards increasing livestock population, rather than raising and intensifying the productivity of individual animals, breeds and species. Even when research is carried out on ruminants it has always been to address the production of cattle and sheep, with little attention to other species like goats (Bogoro *et al*., 1999). Small ruminants are estimated to be about 56.3 million in Nigeria (Blench, 1999), contribute about 30% of all meat (Lebbie, 2004) consumed by the populace in Nigeria; thereby possessing the ability to bridge the gap between demand for animal protein and actual meat supply in Nigeria (Williams, 1990). There are three breeds of goats in Nigeria but only 2 are predominant in the Guinea Savanna, namely the Red Sokoto and the Sahelian. The kids of Red Sokoto goats weigh about 1.5-2.0 kg at birth while adults weigh between 20-35 kg (Osuhor *et al*., 2002). The kids of Sahelian goats weigh between 2.0-2.8 kg at birth and adults weigh between 31-50 kg (Akinwole *et al*., 1999).
The nutritional status of dams during the transition phase in particular has been revealed to have a strong impact on the development, growth and viability of their offspring in pre- and post-natal life among many species (Hansen *et al*, 2012, Faubladier, *et al*, 2012). Birth weight is a significant predictor of future health outcomes of a kid. Kids born with lower than optimum birth weights usually have low energy reserves, decreased thermoregulatory capacity, and increased mortality Neonatal goat kids require regular nursing and substantial gluconeogenesis to maintain normal glycaemia.
The maternal diet has been shown to affect the growth and development of their progeny in various species, including goats, sheep and horses (Abu El-Ella and Kommonna, 2013), Alkass, *et al*, 2013 and Faubladier, *et al*, 2012).

Objectives of the Study
The goal of the study is to evaluate the postpartum weight of West African Dwarf and Sahel doe goats and their progenies fed varied feeds of different browse plants as basal diet, supplemented with cassava peel meal and cowpea haulm as sources of energy and protein respectively. The specific objectives are to:-determine the weights of the dams on different feeds after kidding (postpartum weight gain) and the kids growth performance.

MATERIALS AND METHODS
Experimental Site, Animals and their Management
The bucks were fed Gmelina and cassava peel meal (T1), Gmelina and cowpea husk (T2), Ficus and cassava peel meal (T3) and, Ficus cowpea husk (T4) respectively. Water was given *ad-libitum*. Factorial design, (2 breeds, 3 does and 4 treatments, i.e. 2x3x4) was used. Routine intensive small ruminant management practices were followed.

Data collection
Body weight (kg) and linear measurement (cm) of the animals (dams and kids) were taken on weekly bases throughout the study. Weight of kids were taken 8hrs after birth while weighing of dams commenced 20 days postpartum.

Linear body measurements were taken using a graduated plastic measuring tape.Body length (BDL): was the distance on the dorsal midline from the shoulder to the pin bone. Height at withers (HTW):-This is the vertical distance from the ground to the point of the withers of a standing animal. Chest girth (CGT):-This is the circumference of the body immediately posterior to the front legs.

Data analysis

The data obtained were subjected to analysis of variance procedure as contained in the statistical package of Statistix 8.0(2009) USA. Significant means were compared, using the least significant differences (LSD) procedures.

RESULTS AND DISCUSSION

Kid weights and linear body measurement from weaning to puberty

Table 1 depicts the growth rate of kids, on the different diets from weaning to puberty. The growth parameters varied significantly (P<0.01) with breed, except kid weight.

In all cases the Sahel had higher values than the WAD. Sex however did not significantly affect growth rate except body length (P<0.01) where the males exhibited higher value (50.03cm). Diet significantly (P<0.01) affected all parameters with the values of Gm+Cph being highest and those of Fs+Cph lowest throughout. Furthermore, growth parameters significantly (P<0.01) varied with age except kid weight (WGT). Kid body length (BDL), height at wither (HGW) and chest girth (CGS) changed by 11.12, 4.11 and 5.85cm from 7 to 12 months, although the change for HGW was erratic.

Contrary to the non-significant effect of breed and sex on both WGT and linear body measurement changes from birth to weaning, only WGT by the two factors and, HGW and CGS by sex did not vary significantly. The non-significant weight changes by breed and sex during this interval appears to be a carryover of the pre-weaning phenomenon. This may mean that weight variations by sex among breed in goats are not easily observable during early life under the condition of the experiment, Zahradeen, *et al*., (2008) had made contrary conclusion on Sahel, Red Sokoto and WAD goat breeds. Non-significant weight changes were also obtained by age within this interval. This is not unusual during post weaning interval which is the period of slow growth (i.e., the declining and flattening out section of the growth curve). This observation however is inconsistent with the reports of Otuma *et al.* (1998), Adama and Arowolo (2002) and Zahradeen *et al.*(2008), but similar to that of Alade *et al.* (2007). Slow growth from weaning to puberty had also been reported by Keith, *et al* (2009) and Okere *et al*, (2011).

As regards to all growth parameters (weight and body measurements) by breed, the trend generally showed higher values in Sahel than West African dwarf (for both significant and non- significant parameter) since it is also generally known that Sahel is a bigger goat (than WAD) in frame this result is to be expected. Alade *et al*. (2007) have made similar observations. For sex, males further appeared to show higher trend for these parameters. This has also been reported by Youssouf *et al*. (2014). For commercial goat production therefore advantage could be taken of the bigger frame in Sahel and males.

Table 1: The growth rate of kids fed different feedstuff from weaning to puberty.

Variable	N	Kid WGT (kg)	Kid BDL (cm)	Kid HTW (cm)	Kid CGT (cm)
Overall	262	6.22	47.98	33.96	52.60
Breed		Ns	**	**	**
WAD	147	5.87	41.30^{b}	27.28^{b}	46.21^{b}
Sahel	115	6.57	54.57^{a}	40.64^{a}	54.99^{a}
Sex		Ns	**	Ns	ns
Male	140	6.98	50.03^{a}	34.64	52.18
Female	122	6.36	45.93^{b}	33.29	53.01
Treatment		**	**	**	**
Gm +Cpm	86	5.74^{b}	49.06^{b}	35.34^{b}	54.34^{a}
Gm+ Cph	57	8.75^{a}	50.58^{b}	39.08^{a}	56.44^{a}
Fs+ Cpm	55	5.41^{b}	54.42^{a}	35.25^{b}	56.79^{a}
Fs+ Cph	64	4.98^{b}	37.88^{c}	26.18^{c}	42.33^{b}
Age (Months)		Ns	**	**	**

7	88	6.60	42.95[b]	31.32[d]	49.96[c]
8	82	5.51	45.82[a]	33.77$_a$	51.84[b]
9	51	5.66	47.85[a]	35.43[a]	53.80[a]
10	27	5.84	48.48[a]	35.31[a]	52.42[b]
11	12	6.11	48.75[a]	33.82[a]	51.77[b]
12	2	7.62	54.07[a]	34.13[a]	55.81[a]

**=P<0.01, a, b, c=means in a column with the same superscript are statistically similar, ns=Not Significant. WAD=West African Dwarf. WGT=weight, BDL=bodylength, HTW=Height at wither, CGT=chest girth Gm=*Gmelina arborea*, Fs=*Ficus sycamores*, Cpm= Cassava peel meal, Cph= Cowpea husk

The treatment effect on growth of all variables at this stage favoured Gm + Cph feed (it has highest values for all variables). This indicates that this combination is best for kids during this stage growth. Farmers may be encouraged to leverage on this combination for the growth of the goat from weaning to puberty.

Most of the factors considered had significant effects on linear body measurements except sex on HTW and CGT. Indeed, that for the whole weaning to puberty period sex had significant effect on BDL only shows that sex variation in body measurements of goats including weight during this period was minimal. On the effects of the other factors on body linear measurements, the significant variations may be explained as already alluded to in this manner. Many linear measurements are to some extend skeletal measurements (RahmaniFiroozi, *et al.*, 2017). These measurements are not as subject to short and temporary environmental effects as body weight. Their generally significant differences due to the weighty experimental factors may indicate the true differential effect of these factors on growth, but not observable on the outside through weight. However, even though there were significant differences in the linear measurements with age, they did not show any substantial increases with factors. This confirms the slowing down and stagnation of growth during this period and represents the appearance of the upper end of the sigmoid curve.

Generally growth is expected to be fast and sigmoid in young animals up to puberty or maturity (Zahradeen*et al.,* 2008). Most of the growth is expected preweaning when the young are mostly on milk as observed in this study but should decrease from weaning to puberty when on pasture. However, that it was slow and completely not significant from weaning to puberty is probably because of feeding of browse to them (post weaning). At this stage they had just been weaned from milk and their stomach may not have been fully prepared for feeds containing browse.

Correlation coefficients between age and body measurements

The correlation coefficients between age and body measurements of WAD and Sahel goats are presented in Tables 17 and 18. All the correlation coefficients were high significant (P<0.01) and positive. The correlation for WAD ranged from 0.4504 to 0.873. On the otzher hand, those for Sahel varied between 0.7582 and 0.8615.

All the correlation values between age and body measurement were high and significant. This means that all pairs of measurements can be used to indicate each other.

Rotimi *et al*. (2020) found the correlations between some pairs of measurements namely bodyweights and length; chest girth and height at wither to be high andsignificant. Aliyu *et al*. (2021), on the other hand, found several correlations between body measurements in Sahelian goats to be positive and significant (p<0.01); some others e.g. between birth weight and tail length, were negative. Non-significant correlations were also observed e.g. between heart girth and tail length.

Table 2: Correlations between age, weights, and body measurements of WAD goat

	AGE	**BDL**	**CGS**	**HGW**
BDL	0.6186***			
CGS	0.6070***	0.7916***		
HGW	0.4503***	0.6339***	0.8723***	
WGT	0.8442***	0.7635***	0.8309***	0.7224***

*** =Significant at P<0.001; WGT= Weight; BDL=Body length; CGS=Chest girth size; HGW= Height at wither

Table 3: Correlations between age, weights, and body measurements of Sahel goat

	AGE	BDL	CGS	HGW
BDL	0.7851***			
CGS	0.8588***	0.7926***		
HGW	0.8262***	0.7582***	0.8506***	
WGT	0.8615***	0.7647***	0.8112***	0.7926***

*** =Significant at P<0.001; WGT= Weight; BDL=Body length; CGS=Chest girth size; HGW= Height at wither;

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