Reproductive performance of West African Dwarf goats fed with *Moringa oleifera*

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Background

West African Dwarf (WAD) goat is the most prolific goat species (Plate 1). A non-seasonal breeder with the possibility of kidding 5 times in 3 years. In most tropical countries, lack of genetic improvement and inadequate nutrition undermines WAD goats in expressing their full genetic and productivity potential. These result into high mortality rates in kids (50%) and low fecundity in adult females. A bid to improve WAD goat performance, calls for the exploration of alternative but nutritious feed sources such as *Moringa oleifera*; a multi-purpose plant (Plate 2). Hence, we evaluated the reproductive parameters of WAD does' as influenced by *M. oleifera* during and after gestation and the performance of their resulting kids after parturition.

Approach

Grouping and Acclimatization	• Five treatments (T1 – T5) with 5 replicates • Increasing proportion of *M. oleifera* in relation to *G. sepium* at 0%, 25%, 50% 75%, and 100% across T1 to T5
Feeding	• Forage: based on treatment diet composition and 4% body weight of does' on dry matter bases • 100g of concentrate per doe per day
Oestrus synchronization	• 0.4mls of progesterone per doe, every other day for 6 consecutive days • Introduction of bucks, 24 hours post hormonal administration
Reproductive parameter	• Conception rate, litter size at birth and gestation length in does • Birth weight, milk uptake and weaning weight of kids
Analysis	• Chemical and nutritional analysis of the forage plants used as experimental diet (Table 1): AOAC (2000) • Statistical Analysis: SAS 2008

Plate 1: An example of West African dwarf goat used as an experimental doe during the study and her suckling kid.

Parameter (% Dry matter basis)	*G. sepium*	*M. oleifera*
Residual moisture content	9.27	7.66
Ash content	5.6	9.81
Crude protein	21.56	24.55
Crude fibre	10.14	6.69
Ether extract	7.55	10.76
Nitrogen free extract	45.88	40.53
Calcium	0.23	3.6
Phosphorus	4.48	5.15
Potassium	0.25	0.2

Table 1: Chemical and nutritional composition of *M. oleifera* and *G. sepium* leaves. With Ca, P and K calculated as fractions of ash content.

Plate 2: A young flowering *Moringa oleifera* plant. Leaves are oval in shape with opposite leave arrangement.

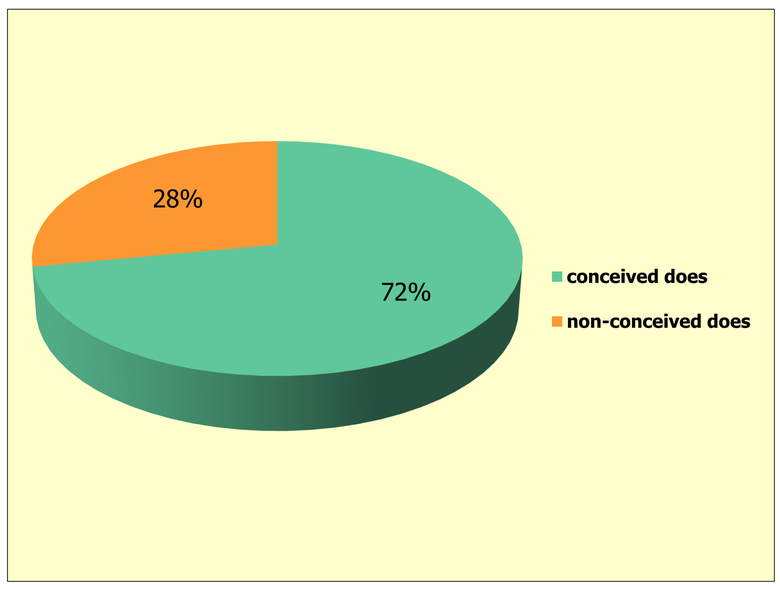

Fig 1: Fecundity rate within the entire experimental does

Result

We used the data of does' which conceived during their next ovulation after estrus synchronization. Of the experimental does' 72% conceived shortly after hormonal withdrawal (Fig 1). Majority of the conceived does' were in treatments fed with >50% *M. oleifera* (Fig 2) with the rest of the does conceiving during their second ovulation. Early conception confers higher fecundity on the does in T3 – T5 as conception rate influences kidding interval .

Conception rate among treatments increased with increasing levels of *M. oleifera* in does' diet (Fig 2), with T5 having the highest rate. Higher conception rate within T3 – T5, indicate that *M. oleifera* is rich in nutrients (protein and energy) to enhance implantation and development of foetus (Fig 3) compared to *Gliriicidia sepium*. As analysis of the feed intake by the does' showed that there was a significant difference ($P<0.05$) in crude protein intake (CPI) among different treatments, with T1 having the lowest (120.1g/day). Average birth weight of kids from does fed with ≥50% *M. oleifera* in their diet was 300gms higher than other groups and 100gms higher than average recorded birth weight for WAD goats. Highest weaning weight of kids ≈5kg were recorded at 3 months in treatments fed with >75% *M. oleifera*. This was found to be due to persistency in milk production in does' of this group (T4 and T5).

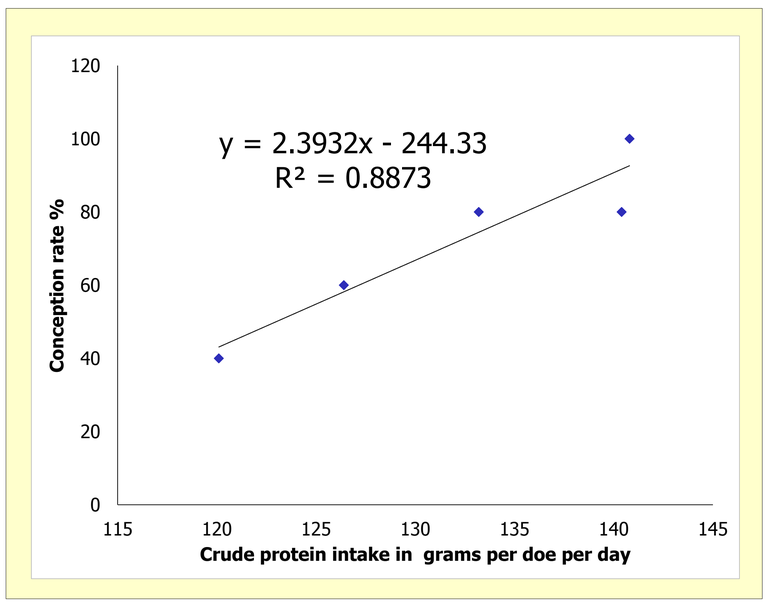

Fig 3: Indicates a direct relationship between conception rate and average daily CP intake by does' in different treatment.

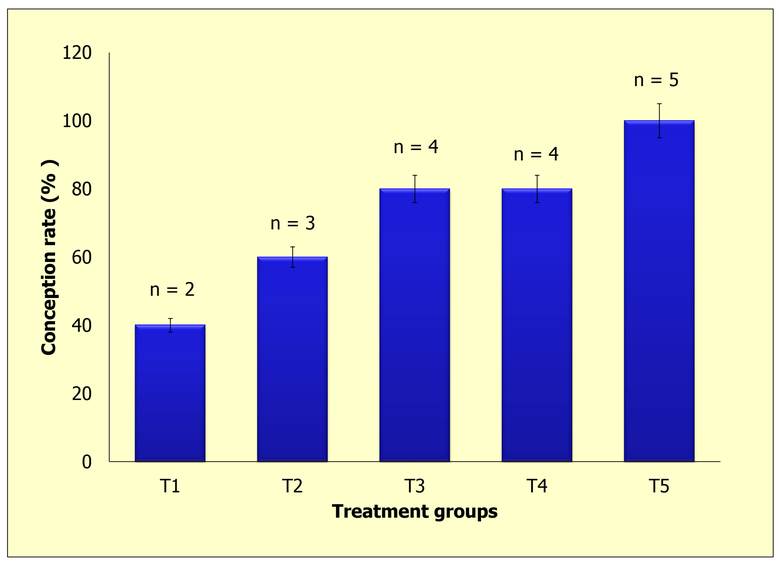

Fig 2: Conception rate in does of different treatments based on diets composition of *G. sepim* and *M. oleifera* respectively. T1= 100%:0%; T2 = 75%:25%; T3 = 50%:50%; T4= 25%:75%; T5= 0%;100%

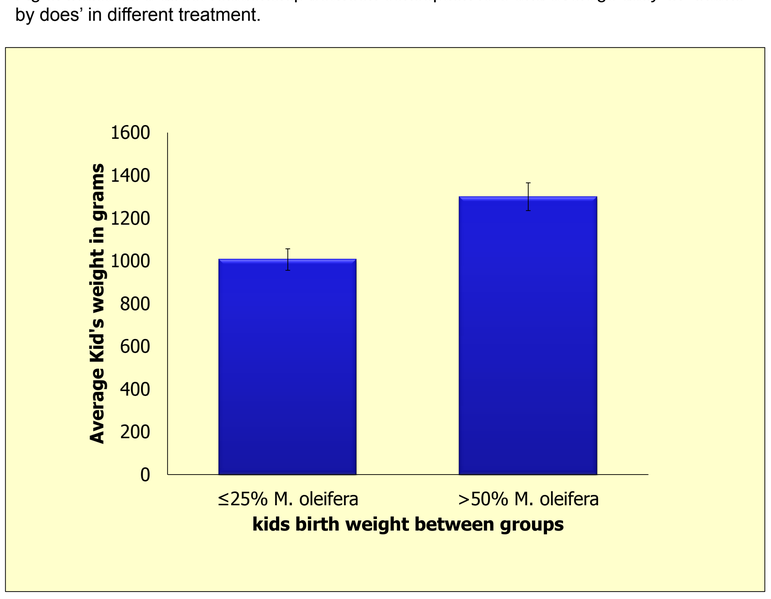

Fig 4: Birth weight of kids between combined treatment groups. ≤25% *M. oleifera* consisting of T1 and T2; >50% consisting of T3, T4 and T5

Conclusion

- Inclusion of high levels of *M. Oleifera* in WAD does' diet (50% and above) do enhance higher conception rate. This indicates better fecundity and invariably improves kidding interval on the long term basis.
- Higher birth weight of kids from WAD goats above the present recorded averages of 1200g is attainable.

This will aid better development of kids which will encourage early weaning, hence improved productivity.

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