

Growth Response of West African Dwarf Goats Fed *Phyllanthus amarus* Meal Supplement

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Abstract

The growth response of WAD goat fed *Chanca piedra* meal supplement were investigated. Sixteen (16) West African Dwarf goats with average initial weight of 9.21kg and are yearlings were used in 12 weeks feeding trial. The WAD goats were allotted to four (4) dietary treatments in a Completely Randomized Design (CRD). *Chanca piedra* were gathered, the leaves were air-dried, milled into powdered form and preserved for inclusion in the experimental diets. Other feed ingredients include cassava peels, wheat offal, palm kernel cake, ruminant premix, Di-calcium phosphate and salt. The experimental diets were diet 1, 2, 3 and 4, respectively. Treatment 1 is control diet, T2 is 0.03%, T3 is 0.05% and T4 is 0.08% of *Chanca piedra* inclusion. The growth response of WAD goats fed the experimental diet indicated that higher ($P<0.05$) final weight was observed at T3 (15.35%) which was significant ($P<0.05$) and it is significantly different from T4 (13.88%), although T1 and T2 are significantly similar which were 12.10% and 12.50%, respectively. The result showed that all the dietary inclusion levels are satisfactory for WAD goats. Inclusion level of 0.05% *Chanca piedra* had better overall result when fed to WAD goats.

Keywords: *Chanca piedra*, Goat, WAD

DESCRIPTION OF PROBLEM

The *Chanca piedra* is a medicinal plant containing antibacterial, antifungal, anti-viral, antioxidant and hepatoprotective properties. The uses of medicinal plants in animal disease management will reduce the risks imposed by residual effect of synthetic antibiotics. It also enhances the nutrients the animal received and also increases the feed intake (1). Ruminants in the tropics in general, are raised predominantly on grasses which are inherently poor in digestibility, nutritive value and unavailability in off season (2). At this period the performance of the ruminant animal which is dependent on the native pasture is seriously impaired, the quality is associated with the fibrous and lignified nature of the pasture which limit intake, digestibility and utilization (3). Small ruminants suffer scarcity of feed supply and pasture quality in the humid region of West African, especially during the dry season when natural vegetable is of poor nutrient value (4) specifically for goat production in Nigeria. Problems of ruminants raised in the tropics largely depend on seasonal feed resources and diseases. Tropical feeds are imbalanced as

they are deficient in essential nutrients and are poorly digestible especially in the dry season. Consequently, intake, digestibility and productivity become low (5). Goats are multipurpose animals producing meat, milk, skin and hair (6). However, this product meat is the major form in which goats are consumed in Nigeria (7). Goat meat is widely accepted and consumed in Nigeria because there is no taboo against it (8). The demand for goat is preferably to those from animal species because of its flavor, tenderness and palatability (9).

MATERIALS AND METHODS

Experimental Site

The experimental was carried out at the Ruminant Unit, Teaching and Research Farm, Ladoke Akintola University of Technology, Ogbomoso. Ogbomoso is located in the derived Savanna Zone that lies on longitude 4°10' East of Greenwich Meridian and latitude 8°10' North of the equator. The altitude ranges from 300m and 600m above sea level while mean temperature and annual rainfall are 27°C and 1247mm respectively (10).

Collection and Processing of Test Ingredients

Chanca piedra was collected at four (4) locations in Ogbomoso town. The leaves were air-dried, milled into powdered form and preserved for inclusion in the experimental diets. Other feed ingredients include cassava peels, wheat offal, palm kernel cake, ruminant premix, Di-calcium phosphate and salt.

Experimental Diets

Four (4) experimental diets were formulated with varying inclusion level of *Chanca piedra* as organic antibiotics. Diets were labeled T1 – T4. Treatment 1 (T1) is the control with 0% inclusion of *Chanca piedra*. Diets 2, 3 and 4 contained 0.03%, 0.05%, and 0.08% *Chanca piedra*, respectively. Other feed ingredients which include; wheat offal, cassava peel, PKC (palm kernel cake), ruminant premix, DCP (Di-calcium phosphate) and salt were carefully weighed in the correct proportion and mixed manually to form the experimental diets tagged *Chanca piedra* meal (CPM).

Preparation of Pens

The floor of the pen was made of concrete and the roof of the Sheep and Goats Unit which housed the pens was made of corrugated iron sheets. The pens were dusted and washed thoroughly with detergent and were further disinfected with broad spectrum insecticide, acaricides and larvicides (Diazintol). DD force and morigard was used to disinfect the surroundings of the pen. The feeding and drinking troughs were washed and disinfected and the whole house was left to rest for two weeks before usage. Wood shavings were spread on the floor of the pens up to a depth of 5cm as bedding materials to enhance prompt removal of urine and faeces and were replaced weekly.

Experimental Animals and Management

The experimental animals were purchased at Iwo, Iwo Local Government Area of Osun State of Nigeria. On arrival, animals were given a prophylactic treatment which consisted of oxytetracycline long-acting antibiotic (1ml/10kg body weight of the animal) and vitamin B complex. They were also drenched with albendazole to control endoparasites and treated for mange and other ectoparasites using Ivomec(R). They were later vaccinated against

Pestes des petits ruminants (PPR) using a tissue culture Rinderpest Vaccine. During the adaptation of six (6) weeks, the animals were allowed to graze on *Panicum maximum* within the paddock, but were introduced to the *Chanca piedra* meal (CPM) a week before the end of adaptation period. Sixteen (16) growing goats comprising eight (8) male and eight (8) females were used for the study. During the period of the experiment, *Chanca piedra* meal (CPM) was offered individually to the animals at 4% body weight for 16 hrs (6:00pm – 10:00am). Animals are allowed to graze on *Panicum maximum* for 8 hrs daily (10:00am – 6:00pm).

Experimental Design

Animals were allotted to experimental *Chanca piedra* meal (CPM) in replicate of four (4) animals per treatment in a Completely Randomized experimental design. Animals on control diet were offered diet without *Chanca piedra*.

Proximate Composition of Experimental Diet

Crude protein (CP), Crude fibre (CF), ether extract (EE) and ash was determined according to (AOAC, 1995) and Nitrogen Free Extract (NFE) was calculated.

Data Collection

Data was collected on daily basis for twelve weeks of experiment.

Growth parameters:

Initial weight (kg): This was taken at the beginning of the experiment and subsequently on weekly basis.

Final weight (kg): This was taken on termination of the experiment.

Daily feed intake (kg): Quantity of feed supplied – left over from the previous day.

Weekly weight gain (kg): Average total weight gain / Number of weeks of experiment.

Feed conversion ratio: Average daily feed intake / Average daily weight gain.

Average daily weight gain: This was computed from variables obtained from weekly weight.

Statistical Analysis

The data collected was subjected to analysis of variance using general linear model of (11). Significant treatment means was compared using Duncan's Multiple Range Tests.

RESULTS AND DISCUSSION

Table 1 showed the growth response of West African Dwarf goats fed *Chanca piedra* meal diet supplement. All parameters are based on (kg). At T1 which was control diet, the animal has initial weight 9.00, final weight 12.10, AFI 30.00, AWG 3.10 and FCR 9.68. At T2 initial weight is 8.50, final weight 12.50, AFI 48.55, AWG 4.00, and FRC 12.14. At T3 the initial weight is 9.85, final weight 15.35, AFI 50.10, AWG 5.50 and FCR 9.11. At T4 the initial weight is 9.50, final weight 13.88, AFI 46.00, AWG 4.38 and FRC is 10.50. The final weight, average feed intake as well as average weight gain (Table 2) were significantly ($P<0.05$) influenced by *Chanca piedra* supplement in ruminant animal diets. There was

significant ($P<0.05$) difference between the initial weight and final weight of West African Dwarf (WAD) goats fed *Chanca piedra* supplement where weight gain is higher. The weight changes were positive for the experimental treatment. The result showed that *Chanca piedra* has no adverse effect on its supplement in ruminant animal diet and it also shows that West African Dwarf (WAD) goats' response to *Chanca piedra* greatly in term of weight gain. The result of this study is in accordance with the reports of (12, 13, 14). The final weight was as a result of varying level of *Chanca piedra* inclusion, animal digestibility, intake ability, environmental factor and how animal respond to feed.

Table 1: Proximate Composition of *Chanca Piedra*

Samples /Parameters	A	B	C	D
Dry matter	12.82	13.00	12.48	12.85
Crude protein	9.85	10.15	9.70	10.38
Crude fibre	17.05	18.00	17.89	17.12
Ether extract	5.90	5.05	4.98	5.00
Ash	5.23	5.98	5.50	5.75
NFE	61.97	60.82	61.93	61.75

Table 2: Growth response of West African Dwarf goats fed *Chanca piedra* meal diet supplement

Treatment/Parameter	T1	T2	T3	T4	SEM
Initial weight (kg)	9.00 ^a	8.50 ^b	9.85 ^a	9.50 ^a	1.00
Final weight (kg)	12.10 ^c	12.50 ^c	15.35 ^a	13.88 ^b	1.80
Average feed intake (kg)	30.00 ^d	48.55 ^b	50.10 ^a	46.00 ^c	2.75
Average weight gain (kg)	3.10 ^b	4.00 ^a	5.50 ^a	4.38 ^a	0.50
Feed conversion ratio (FCR)	9.68 ^c	12.14 ^a	9.11 ^c	10.50 ^b	0.75

^{abcd} Means within each row with different superscript are significantly different ($P<0.05$)

CONCLUSION AND APPLICATION

Chanca piedra is known for its anti-viral, anti-fungi, anti-inflammation. In conclusion, the results of the study revealed that *Chanca piedra* (*Phyllanthus amarus*) helps in improving rumen microbial activities and improving productivity in term of growth. At inclusion level of 0.05% *Chanca piedra* can be included in the diet of West African Dwarf (WAD) since the average feed intake, average weight gain and final weight in T3 revealed its potential utilization in the animal.

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