



Performance and Health Status of Rabbit fed sole or mixtures of Leaves of *Parcuetina nigrescens* and Sunflower

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Abstract: The feeding trial consisted of 3 treatments (N₁ – N₃) and each treatment was replicated 4 times with 4 rabbits per replicate in a completely randomized design. Rabbits in Treatment 1 (N₁) were fed solely on leaf of sunflower (SF) (control), in treatment 2, rabbits were fed *Parcuetina nigrescens* leaf (PN) alone (N₂), while rabbit in treatment 3 (N₃) were fed leaves of sunflower + *Parcuetina nigrescens* leaf in ratio 1:1. Parameters collected were feed intake, weight gain feed conversion ratio, dressing percentage among others. There was no significant difference in the daily fed intake of the rabbit fed solely either PN and SF (p>0.05), the values ranged between 68.92g/day in N₃ and 69.12g/day in N₁ (p>0.05). There was a significant difference in the mean weight of the rabbits fed experimental forages (p<0.05). The highest weight gain was recorded in the rabbit fed PN alone which was relatively the same with those fed mixtures of PN and SF (p>0.05). The feed conversion ratio in N₂ and N₃ was not significantly different from each other (p>0.05). The crude protein and fibre digestibilities were better in the rabbits fed N₂ than N₁ (p<0.05). The highest dressing percentage was recorded in N₂ which was not significantly different from N₃. The heart, liver and lung weight percentages were relatively the same in all the treatments (p>0.05). Based on the results of better weight gain, feed efficiency, zero mortality, higher dressing percentage recorded in the treatment fed solely PN and its mixtures with sunflower, also feeding PN to rabbits did not have any adverse effect on health status of the rabbits, it could be concluded that *Parcuetina nigrescens* could be used as alternative feed resource for rabbits.

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Introduction

Rabbit is a four-footed animal reared in a cage or floor for supplying of meat and wool. Rabbit is not as aggressive as grass-cutter. The meat is tasty and delicious. Rabbit meat tastes better than other conventional livestock (Kentor,1990; Fayenuwo *et al.*, 2017). There is no religious taboo against eating of rabbit meat. The protein content of the meat is about 16–18% crude protein which compare favourably to other conventional livestock meat (Babatunde *et al* 2001; Omole *et al.*,2007; Fayenuwo *et al.*,2017) The meat of rabbit is low in cholesterol and it is a good antidote for those that have fat related disease such as hypertension (Kentor,1990; Fayenuwo *et al.*,2017). Rabbit farming can be started with very low capital. It can be fed with forages, household waste with little concentrate. The management practices are simple and could be reared at backyard. Rabbits is also classify as pseudo-ruminant because of its ability to eat forages and digest fibre like sheep,

goat and cattle although it does not possess 4 complex stomach (Rumen, Abomasum, reticullum and Omasum) (Babatunde *et al.*, 2001; Omole *et al.*, 2007). The performance of rabbit depends mainly on quality of the feed and other management practices (Babatunde *et al.*, 2001; Omole *et al.*, 2007). Rabbit can tolerate high fibre diet than poultry. The basal diet for rabbit is forages. Supplementation with concentrate is needed to improve the performance of the rabbit. Forages that can be fed to rabbit include the following: Sweet potato leaf, Cocoyam leaf, Cassava leaf, Leucaena leaf, Pawpaw leaf, Tridax, Sunflower, *Stylosanthes gracilis* (Babatunde *et al.*, 2001). There are lots of other feed resources in Nigeria that are considered as weed but contain nutrients that can be fed to livestock and rabbit in particular, among the forages is *Parquetina nigrescens* (Plate 1). *Parquetina nigrescens* (Afzel.) (Ewe Ogbo) in (Yoruba) is a

shrub that is commonly found in West African countries especially Nigeria and Ghana (Imaga *et. al.*, 2010; Aderibigbe *et. al.*, 2011).



Plate 1: *Parquetina nigrescens* leaf

It is a perennial with twining stem and woody base shortly tapering 10-15cm long, 6-8cm broad with a smooth long stem on the leaves. The plant have been shown to have haematinic, anti-diabetic, anti-ulcerative and antioxidant properties (Imaga *et. al.*, 2010; Aderibigbe *et.al.*, 2011). *Parquetina nigrescens* is rich in iron which is an essential element for blood production (Aderibigbe *et.al.*, 2011). With all the attributes of PN, there is paucity of information on its utilization in livestock. Preliminary study on the use of the leaf as feed for rabbits though not documented shows that rabbit relishes on the leaves hence this study was conducted to determine the performance of rabbit fed sole and mixtures of sunflower and *Parquetina nigrescens* leaves.

Methodology

The experiment was carried out at the Rabbitry Unit of the Institute of Agricultural Research and Training (I.A.R. & T.), Moor Plantation, Ibadan, located on Longitude 03°51E, Latitude 07°23N and Altitude 650' lies in the humid zone of the rainforest belt 0703.25 of Southwestern Nigeria with mean annual rainfall of 1220 mm and mean temperature of 26°C. A total of forty eight crosses of Chinchilla and white California weaned rabbits of mixed sexes of mean weight 625±5.8g were used for the feeding trial. The feeding trial consisted of 3 treatments (N₁ – N₃) and each treatment was replicated 4 times with 4 rabbits per replicate in a Completely Randomized Design. Rabbits in Treatment 1 (N₁) were fed solely on leaf of sunflower (SF) (control), in treatment 2, the rabbits were fed *Parquetina nigrescens* leaf (PN) alone (N₂), while rabbit in treatment 3 (N₃) were fed leaves of sunflower + *Parquetina nigrescens* in ratio 1:1. The initial weight of the rabbits was taken at the beginning of the feeding trial and subsequently at

interval of one week with a weighing balance. Feed intake was taken on a daily basis by deducting the left-over feed from feed given. Feed conversion ratio was also calculated as the ratio of the feed intake to weight gain. Four rabbits were randomly selected from each treatment and housed individually for digestibility study. The rabbit in each treatment was given the same feed given during the feeding trial. Feaces and urine were collected on daily basis, weighed and stored inside refrigerator. Seven days were used for the collection. At the end of seven days, the faecal were bulked for each animal for proximate analysis and the urine was bulked for nitrogen analysis. At the end of the feeding trial, four rabbits per replicate were randomly selected and weighed for carcass and organ evaluation. The rabbits were starved overnight and slaughtered by severing the jugular veins, scalded in warm water for about a minute, and the fur were plucked manually. The rabbits were eviscerated and weighed to obtain their dressed carcass weights. The kidney, liver, gizzard, heart, spleen, small intestine and large intestine were removed and weighed using a sensitive electronic scale and grossly examined for any pathological changes. The chemical composition of the experimental diets and the foot were done according to the method of A O A C (1990). All data were subjected to statistical analysis using analysis of variance and the means were separated if they were significantly different using Duncan Multiple Range Test (SAS 2000).

Results And Discussion

Table 1: Determined Proximate Composition of sole and mixtures of sunflower and *Parquetina nigrescens* leaf.

Parameters	N ₁	N ₂	N ₃
Dry Matter	30.78	30.12	30.23
Crude Protein	20.15	21.86	20.34
Crude Fibre	19.44	16.49	18.34
Ether Extract	5.43	5.56	5.50
Ash	10.11	12.79	11.52
Nitrogen Free Extract	44.87	43.3	44.30

N₁ - leaf of sunflower (SF) (control), N₂- *Parquetina nigrescens* leaf (PN) alone, N₃ – SF+PN

The chemical composition of the PN, SF and their mixtures is as shown in table 1, The crude protein of PN is numerically higher than that of SF and their mixtures, the values for CP for SF, PN and PNF is 20.15, 21.86 and 30.23% respectively, the crude fibre of PN was lower than that of sunflower. The iron content of PN was also higher than that of SF as

reported in table 1. As reported earlier by different authors, PN contains high protein, iron, potassium and calcium and the values reported was relatively the same with the reports of Imaga *et. al.*,2010; Aderibigbe *et. al.*, 2011;

The low fibre reported compared to the observation of Kayode *et. al.*, 2009 could be due to seasonal effect and the age of the leaf. It has been reported that the leaves of plants are more succulent during the rainy season compared to dry season (Kentor, 1990; Omole *et. al.*, 2007). Table 2 shows the summary of performance indices of rabbits fed different forages, there was no significant difference in the daily fed intake of the rabbit fed either PN and SF as presented, the values ranged between 68.92g/day in N₃ and 69.12g/day in N₁ (p>0.05). There was a significant difference in the mean weight of the rabbits fed experimental forages (p<0.05) as presented in Table 2, the highest weight gain was recorded in the rabbit fed PN which was relatively the same with those fed mixtures of PN and SF (p>0.05). The lowest weight gain of 15.34 g/day was recorded in N₁ fed SF alone. The highest weight gain recorded in the N₂ could be due to succulence nature of PN compared to SF and high protein content of PN as shown in table1, again it has reported that PN contain high protein and rich in iron (Odetola *et. al.*,2006).

The feed conversion ratio in N₂ and N₃ was not significantly different from each other (p>0.05). The better feed conversion ratio recorded in N₂ could be due increased weight gain compared to N₂. Zero mortality was recorded in all the treatments as shown in Table 2. The zero mortality recorded could be due to proper management practices adhered to during the course of the feeding trial. The zero mortality recorded could also be due to saved nature of the test feed resource as reported earlier that human being used to drink the extract of PN as a source of iron for those that have shortage of blood without any detrimental effect (Raharjo *et. al.*,1990; Kayode *et. al.*, 2009; Aderibigbe *et. al.*, 2011). The crude protein and fibre digestibilities are better in the rabbits fed N₂ than N₁ (p<0.05) and this could be the reason for better performance in terms of weight gain and efficiency of feed utilization as reported in Table 2. It was reported that digestibility of nutrients is affected by feed intake, protein and fibre of the feed (Babatunde *et. al.*,2001; Omole *et. al.*, 2007). The dressing percentage of the rabbits fed experimental forages was affected by dietary treatments (p<0.05) as shown in table 5. The vales reported in N₁,N₂ and N₃ was 71.93,74.6 and 74.45% respectively. The highest DP was recorded in N₂ which was not significantly different from N₃.

Table 2: Summary of Performance Indices of rabbit fed sole and mixtures of sunflower and *Parcuetina nigrescens* leaf.

Parameters (Mean values)	N ₁	N ₂	N ₃	±SEM	P value
Total feed intake	6200.1	6220.8	6202.8 ^b	30.89	0.05
Daily feed intake (g)	68.89	69.12	68.92	0.75	0.05
Initial weight (g)	524.35	526.23	524.9	4.32	0.05
Final weight (g)	1904.95 ^b	2131.83 ^a	2084.62 ^a	59.89	0.05
Total weight gain (g)	1380.6 ^b	1605.6 ^a	1559.72 ^a	58.41	0.05
Daily weight gain (g)	15.34 ^b	17.84 ^a	17.33 ^a	1.32	0.05
Feed conversion ratio	4.49 ^a	3.87 ^b	3.97 ^b	0.23	0.05
Crude protein dig.	65.42 ^b	67.21 ^a	66.43 ^a	1.56	0.05
Crude fibre dig.	63.34 ^b	66.52 ^a	66.05 ^a	2.11	0.05
Mortality	0.0	0.00	0.0	-	

Means along rows with different superscript are significantly different from each other (P<0.05)

N₁ - leaf of sunflower (SF) (control), N₂- *Parcuetina nigrescens* leaf (PN) alone, N₃ – SF+PN

The DP recorded in N₂ and N₃ was relatively the same with the report of (Raharjo *et. al.*,1990; Omole *et. al.*,2007). The better DP recorded in N₂ is

an indication that PN could be used as substitute for SF in the diet of rabbit.

Table 3. Carcass analysis of weaned rabbit fed sole and mixtures of sunflower *Parquetina nigrescens* leaf

Parameters (Mean values)	N ₁	N ₂	N ₃	±SEM	P value
Live-weight (g)	1900.5	2129.13	2032.23		0.05
Defurred weight	1843	2092.10	1989.6	29.41	0.05
Fur weight %	6.14	6.18	6.19	1.56	0.05
Eviscerated weight	1367.03 ^c	1588.3 ^a	1513.0 ^b	23.24	0.05
Dressing %	71.93 ^b	74.6 ^a	74.45 ^a	1.13	0.05
Heart weight %	0.74	0.75	0.75	0.12	0.05
Liver weight %	2.73	2.77	2.7	0.21	0.05
Lung weight %	1.88	1.91	1.89	0.04	0.05

Means along rows with different superscript are significantly different from each other ($P < 0.05$)

N₁ - leaf of sunflower (SF) (control), N₂- *Parquetina nigrescens* leaf (PN) alone, N₃ – SF+PN

Changes in lung, liver and heart sizes could be a sign of abnormality and diseases in livestock, it has been reported that animal with enlarged heart, liver and lung could be suffering with one ailment or other (Omole *et. al.*, 2007; Fayenuwo *et. al.*, 2017) The heart, liver and lung weight percentages were relatively the same in all the treatments ($p > 0.05$) thus indicating that the forages served to the rabbits had no detrimental effect on the health status of the rabbits and these also reflected on the zero mortality recorded in all the treatments as shown in table 2.

Conclusion

Based on the results of better weight gain, feed efficiency, zero mortality, higher dressing percentage recorded in the treatment fed solely PN and its mixtures with sunflower, also feeding PN to rabbits did not have any adverse effect on health status of the rabbits it could be concluded that *Parquetina nigrescens* could be used as alternative feed resource for rabbits. Further research study should be conducted on the effect of feeding *Parquetina nigrescens* to breeding rabbits on reproduction indices of rabbits.

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