

Effects of Fenugreek Seed (*Trigonella foenum - graecum*) and Coriander Leaf (*Coriandrum sativum*) as Feed Additives on the Growth Performance and Carcass Characteristics of Weaned Rabbits

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Abstract

A 35 day study was conducted to carry out effect of fenugreek seed and coriander leaf as feed additives on growth performance and carcass characteristics of weaned rabbits. Thirty six unsexed weaned rabbits were randomly assigned to four treatments; each treatment comprised of three replicates with three rabbits each. Treatment 1 contained basal diet with no feed additive which served as the control, treatment 2 were served basal diet plus 250g fenugreek seed powder, treatment 3 were served basal diet plus 250g coriander leaf powder and treatment 4 were served basal diet plus a mixture of 125g fenugreek seed powder and 125g coriander leaf powder. Data were collected on growth performance and carcass characteristics and were subjected to analysis of variance (ANOVA) in a completely randomized design. Significant differences ($p < 0.05$) were observed in the growth performance parameters in which treatment 2 had the highest average weight gain performance value of (416.00g), followed by treatment 4 (316.17g), treatment 1 (313.83g), while treatment 3 had the lowest weight gain (263.17g). No significant differences ($p < 0.05$) were observed in all carcass characteristics parameters. From the result of this study, it can be concluded that fenugreek seed powder added at the dosage of 250g improved the growth performance of the weaned rabbits.

Keywords: Carcass characteristics, Coriander Leaf powder, Fenugreek seed Powder, Growth performance and Weaned rabbits

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INTRODUCTION

Antimicrobial compounds are commonly included in Rabbitary diets for promoting of growth and control of diseases. The European Union banned feed antibiotic growth promoters, due to, not only cross-resistance, but also to the risk of possible drugs multiple resistances in human pathogenic bacteria. Feeds containing no chemical additives are increasingly used in rabbitary nutrition. Consequently, the animal feed manufacturers are exposed to increasing consumer pressure to reduce the use of antibiotic growth promoters as feed additive and find alternatives to antibiotic growth promoters in Rabbitary diets (Humphrey, 2002).

Many scientists searched for alternatives to antibiotics growth promoter (Kamel, 2001). The feed manufacturers are adopting new forms of natural feed additives that are the product of modern science (Wezyk and Poltowicz, 2000). Therefore, the effects expected of herbs and plant extracts are also various: the herbs and plant extracts act on the appetite and intestinal, microflora, stimulate the pancreatic secretions to increase endogenous enzyme activity and immune system. Many plant products and their constituents have a broad antimicrobial activities antioxidant and sedative properties. Besides, scientists recently discovered that the appetizing and stimulating activity of herbs and plant extracts on animal digestive and immune system could benefit performance and health of farm animal (Tucker, 2002).

Fenugreek (*Trigonella foenum graecum*) is grown mainly in India, Pakistan and China. Its seed have mainly therapeutical effects such as hypoglycemic, anti-helminthic, anti-inflammatory and anti-microbial properties (Bash *et al.*, 2003). It also contains lecithin and chlorine that help to dissolve cholesterol and fatty substances. It also contains neurin, biotin, trimethylamine which tends to stimulate the appetite by their action on the nervous system (Micheal and Kumawat, 2003). Fenugreek leaves and seeds have been used extensively to prepare extracts and powders for medicinal used (Smith, 2003).

Coriander (*Coriandrum sativum*) is an aromatic plant, is an annual species of the parsley family, native to the eastern Mediterranean region and southern Europe, and is found in many other parts of the world. As a medicinal plants, Coriander (*Coriandrum sativum*) has been used as antimicrobial (Singh *et al.*, 2002) hypocholesterolemic (Chithara and Leelama, 1999) substance. In addition, it has appetizing and stimulatory effects in the digestion process (Cabuk *et al.*, 2003).

Based on the aforementioned properties, a research study was conducted to explore the potential of combining Fenugreek seed meal and Coriander leaf meal as natural feed additives in the diets of weaned rabbits.

MATERIALS AND METHODS

EXPERIMENTAL SITE

The experiment was carried out at the livestock unit of the Federal college of Agriculture Moor Plantation, Ibadan, Nigeria.

DURATION OF EXPERIMENT

The experiment lasted for 5 weeks (35 days)

SOURCE AND PROCESSING OF TEST INGREDIENTS

Dried fenugreek seeds and coriander leaves were purchased from a market in Ibadan and both were milled together to obtain product herein refers to as fenugreek seed powder (FSP) and coriander leaves Powder (CLP) all the test ingredients were stored in sacs until they were needed.

EXPERIMENTAL DIET AND MANAGEMENT

Table 1 presents the ingredients composition of the weaned rabbit diets according to the experimental design. All rabbits were reared in hutches and were thoroughly cleared. Access to feed and water was provided and good hygiene was also maintained during the study.

EXPERIMENTAL RABBITS AND DESIGN

Thirty-six unsexed rabbits were purchased from a reputable farm at Ibadan. The rabbits were acclimatized for a week and later randomly assigned to four (4) treatments; each treatment comprised three (3) replicates with 3 rabbits each. All rabbit were rear in hutches and the hutches were properly cleaned. The rabbit were provided with clean water ad-libitum while feed were served twice daily by 08.00hr and 16.00hr. Feed offered and the left-over feed were weighed to determine the feed intake of the animal, after the initial weight, weekly weight were taken, this record were used to determine the performance parameter. Good hygiene was also maintained during the study.

The groups were allocated as follows:

T₁(control) = basal diet with no feed additive.

T₂ = basal diet plus 250g fenugreek seed powder

T₃ = basal diet plus 250g coriander leaf powder

T₄ = basal diet plus a mixture of 125g fenugreek seed powder and 125g coriander leaf powder.

DATA COLLECTION

PERFORMANCE CHARACTERISTICS

Data on the feed and water intake were taken on daily basis. Daily feed intake was used to work out weekly feed intake. Feed intake was calculated by feed offered – feed refused and water was given to them ad – libitum.

Weekly weight gain was calculated by subtracting initial weight from final weight of each week and weekly FCR was calculated by dividing weekly feed consumed by weekly weight gain.

Average Weight Gain (g) = Final weight – Initial weight (g/rabbit/day);

Feed intake (g) = Feed given – Feed left (g/rabbit/day);

Feed Conversion Ratio = $\frac{\text{Feed Intake}}{\text{Weight gain}}$

CARCASS CHARACTERISTICS

At the end of the experiment, one rabbit from each treatment were randomly selected such that their weights were similar to the mean weight of each replicate for the evaluation of carcass characteristics. Prior to slaughtering, the rabbits were made to fast but given water in order to flush the gut tract and live weight of each selected rabbit was taken. Each rabbit were skinned and eviscerated for organs weight (heart, liver, kidney, lungs, spleen, full intestine) and a standard cut of fore limb, hind limb, head for carcass evaluation.

STATISTICAL ANALYSIS

The experimental design was a Completely Randomized Design (CRD) and data obtained were subjected to one-way Analysis of Variance using SAS (1999).

Significant (P<0.05) means among variables were separated using Duncan Multiple Range Test as contained in the SAS (1999) package.

Experimental model;

$Y_{ij} = \mu + T_i + \sum_{ij}$

μ = Population mean

T_i = Effect of dietary treatments

\sum_{ij} = residual error

Table 1: Gross Composition of Experimental Diets

Ingredients	Composition (Kg)
Maize	40.00
Soyabean meal	6.00
Groundnut cake	5.00
Wheat offal	44.00
Bone meal	2.00
Limestone	2.00
Lysine	0.25
Methionine	0.25
Premix	0.25
Salt	0.25
Total	100.00
Calculated Chemical Composition	
Crude Protein (%)	16.00
Metabolisable Energy (kcal/kg)	2483.60
Crude fibre (%)	5.20
Ether extract (%)	3.66
Calcium (%)	1.23
Phosphorus (%)	0.38

RESULT

Table 2: Effect of Fenugreek Seed Powder and Coriander Leaf Powder on the Growth Performance of Weaned Rabbits

Parameters	T ₁	T ₂	T ₃	T ₄	SEM
Initial weight (g)	590.50	586.67	590.17	588.20	49.27
Final weight (g)	904.33	1002.67	853.34	904.37	114.31
TFI (g)	987.77 ^b	1004.50 ^a	1000.90 ^a	1005.30 ^a	2.38
Weight gain (g)	313.83 ^b	416.00 ^a	263.17 ^c	316.17 ^b	7.63
ADWG (g)	8.97 ^b	11.89 ^a	7.52 ^c	9.03 ^b	0.22
ADFI (g)	28.22 ^b	28.70 ^a	28.60 ^a	28.72 ^a	0.07
FCR	3.15 ^b	2.41 ^c	3.83 ^a	3.18 ^b	0.09

^{a,b,c} Means with different superscript on the same row differ significantly different ($p < 0.05$)

TFI = Total Feed Intake,

ADWG = Average Daily Weight Gain

ADFI = Average Daily Feed Intake

FCR = Feed Conversion Ratio

Table 3: Effect of Fenugreek Seed Powder and Coriander Leaf Powder on Carcass Characteristics of Weaned Rabbits

Parameters	T ₁	T ₂	T ₃	T ₄	SEM
FLW (g)	939.00	867.00	800.00	823.00	97.05
DW(%)	52.04	47.66	50.64	50.37	3.33
Head(%)	9.86	10.49	9.91	9.62	0.85
Forelimb(%)	6.07	6.08	6.08	6.43	0.47
Hind limb (%)	12.50	11.47	12.11	11.75	1.03
Liver(%)	2.51	2.44	2.51	2.57	0.16
Lungs(%)	0.83	1.04	1.14	0.98	0.15
Spleen (%)	0.14	0.12	0.12	0.12	0.02
Kidney (%)	0.71	0.58	0.79	0.84	0.13
Hearth (%)	0.39	0.35	0.38	0.25	0.05
Full Intestine (%)	19.03	20.51	19.50	20.80	1.47

FLW = Final Live Weight

DW = Dressed Weight

DISCUSSION

Table 2 shows effects of FSP and CLP on the growth performance of weaned rabbit. Although, there were no significant difference ($p > 0.05$) for initial and final weight across the treatments but it was observed that T₂ had the

highest weight gain (416.00g) which suggests to their high feed intake and phytogetic attributes and the value is highly significantly different ($p < 0.05$) to T₁ (313.83g), T₄ (316.17g) and T₃ (263.17g). The result of this study is similar to the study of Zeweil, 2015, who observed an improvement of body weight gain of rabbits fed fenugreek based diet which he said might be attributed to the active compounds such as antibacterial, antifungal, anti-inflammatory and antioxidant properties of fenugreek seed powder.

However, total feed intake parameters had significant difference ($p < 0.05$) across the treatments. T₂ (1004.5g), T₃ (1000.9g) and T₄ (1005.3g) were significantly different ($p < 0.05$) to T₁ (987.77g) which had the lowest feed intake being the control experiment. This correlates to the report of Hernandez *et al.*, 2004 who reported that the improvement due to fenugreek seed has stimulating effect of the digestive system. This also agrees with Micheal and Kumawat, 2003 and Alloui *et al.*, 2012 who reported that fenugreek seed also contain neurons, biotin, trimethylamine which tends to stimulate the appetite by their action on the nervous system. The FCR was significantly different ($p < 0.05$) across the treatments but was it was lowest in T₂ (2.41) which implies that the rabbits on T₂ had the best feed conversion to meat.

Table 3 shows the effect of FSP and CLP on the carcass characteristics of weaned rabbits. The values for carcass characteristics were not significantly different ($p > 0.05$) across the treatment FSP based diet had the lowest values for dressing percentage (47.66%), hind limb (11.47%), liver (2.44%), spleen (0.12%) and kidney (0.58%). The value for the dressing percentage for this study is in contrast with that reported by Alloui *et al.*, 2012 who reported an increase in dressing percentage of rabbit feed fed with fenugreek seed powder. However, it was observed that rabbits on fenugreek based on diet had the highest value for head weight percentage (10.49%) as compared to other diets.

CONCLUSION

From the result of this study, it can be concluded that:

Fenugreek seed powder based diet improved the growth performance of weaned rabbits at 250g but showed little or no effect on carcass characteristics. Coriander leaf powder based diet had less effect on growth performance and carcass characteristics of rabbits at 250g.

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