

EFFECT OF FEEDING VARYING LEVELS OF JATROPHA (*Jatropha curcas*) SEED CAKE ON THE PERFORMANCE OF GROWING RABBITS

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ABSTRACT

A total of 24 growing rabbits of mixed breeds and sexes were used to evaluate the effect of inclusion levels of Jatropha seed cake (JSC) in concentrate diet on the performance of growing rabbits. The experiment was in a completely randomized design involving three treatments which represented 0, 5 and 10% level of JSC inclusion levels. The experiment lasted for 8 weeks. There was significant difference ($P < 0.05$) in weight gains, feed intake and feed: gain ratios across the dietary treatments. Rabbits fed on control and 5% JSC diet had the highest ($P < 0.05$) weight gain, while rabbits fed the 10% JSC inclusion level had the lowest. From the results obtained it can be concluded that JSC meal can be incorporated up to 5% in the diet of growing rabbits without any adverse effect on their performance.

INTRODUCTION

Rabbit is one of such microlivestocks, been a pseudo-ruminant with a high reproductive rate (short reproduction cycle) and is potentially more efficient than other livestock at converting simple feeds and forages and other non conventional feedstuff into meat. Compared with the meat of other animal species, rabbit meat is richer in proteins, certain vitamins and minerals, the energy and protein requirement per unit live weight gain is greater than that of most livestock. High cost of feed has limited the production of rabbits (Lebas *et al.*, 1986) and in order to encourage rabbit production, alternative sources of feed which are cheaper, readily available and do not compete with human feed needs are required. The Jatropha seed cake (JSC) is one of such non-conventional feedstuff that is produced in large quantities all over the world (12-48tonnes/ha). It is a cheap source of protein (Henry, 1996) having 25-30% crude protein and about 11% oil after extraction. The seed cake is currently been used as a fertilizer. The limitation to its use in livestock feeding is due to the presence of phorbolsters and lectins, which have been found to be toxic. This can be detoxified by the use of heat or solvent dissolution which can be carried out on the farm. The objectives of this study were to determine the chemical composition of Jatropha seed meal and the performance of growing rabbits fed diets with Jatropha seed cake inclusion levels.

MATERIALS AND METHODS

Location of study

The experiment was conducted at the Teaching and Research farm of the Department of Animal Science Ahmadu Bello University, Samaru-Zaria. The Farm is located between 12°N and longitude 8°W, at an altitude of about 640m above sea level (Ovi map, 2014). Samaru lies within the Northern Guinea Savannah with about 1100mm annual rainfall, with its peak at August. The daily mean temperature range between 21-36°C (IAR, 2014)

Sources and processing of Jatropha seed

The Jatropha seed cake was obtained from the National Research Institute for Chemical Technology, Basawa Zaria, Kaduna state. It was a waste by product of mechanically extracted Jatropha seed oil that was meant for diesel production. The mechanical extraction of the Jatropha seed involved the following pretreatments and extraction procedures. The seeds were dried under the sun for 7days, the seeds were decorticated and the kernels were separated from the husk by a winnowing machine. The kernels were then crushed using hand screw presser. The extracted oil was refined and used as bio-fuel. The oil cake of Jatropha obtained was then used for this study.

Experimental diets and treatments

The percent composition of the experimental diet is presented in Table 1. Three isonitrogenous diets with 18% CP were formulated to contain JSC at 0, 5 and 10% levels of inclusion to replace groundnut cake. Other ingredients in the diets are maize bran, wheat offal, rice offal, salt, bone meal

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Table 1. Percent ingredient composition of experimental diets

Ingredients	Level of JSC inclusion		
	T1 (0)	T2 (5)	T3 (10)
Maize offal	70.9	71.7	67.65
groundnut cake	19.50	18.75	17.85
JSC	0	5.0	10.0
Rice offal	5.0		
Salt	2.0	2	2.0
Bone meal	2.0	2.0	2.0
Vitamin Premix	0.5	0.5	0.5
Total	100	100	100
Cost/kg of feed	47.86	42.57	40.15

Table 2. Proximate composition of experimental diets and JSC.

Parameters	Level of JSC inclusion			JSC
	0	5	10	
Dry matter	89.64	90.49	89.39	95.95
Crude protein	17.6	17.62	17.85	18.0
Crude fiber	9.09	11.5	11.11	27.19
Ether Extract	12.72	16.98	19.64	26.78
Ash	10.6	8.62	10.85	9.17
NFE	54.99	54.28	47.55	18.86

Table 3. Performance of growing rabbits fed Level of JSM inclusion

Parameters	Level of JSC inclusion			SEM
	0	5	10	
Initial Wt(g)	332	330	333	10.65
Final Wt(g)	1100 ^a	1010 ^b	676 ^c	14.59 ^a
Weight Gain(g)	768 ^a	680 ^a	327 ^b	22.49 ^a
ADWGain(g)	13.71 ^a	12.14 ^a	5.85 ^b	0.40 ^a
Feed Intake (g)	40.94 ^a	38.14 ^a	8.00 ^b	0.90 ^a
Feed :gain ratio	0.033	0.031	0.73	

^{a,b,c} Mean values with different superscripts within a row differ significantly (P<0.05), ADWG daily weight gain