PERFORMANCE OF GROWING RABBITS FED MELON HUSK BASED DIETS

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Abstract
An experiment was carried out to evaluate the performance of growing rabbits (n=24) fed melon husk (MH) based diets for a period of 8 weeks. The rabbits were allocated in a completely randomized design to 3 dietary treatments of 0%, 10% and 20%MH for treatments 1 to 3, respectively of 8 rabbits each with each group further subdivided into two groups of 4 rabbits each. Results revealed that feed intake decreased as the values of MH inclusion increased (P>0.05) in the diets. The daily weight gain (g/day) varied (P<0.05) across treatments ranging from 10.71 to 12.14 with 20%MH and the control diet been significantly the same (P>0.05), with the feed conversion ratio following the same trend. Nutrient digestibility differed (P<0.05) across treatments with crude protein values ranging from 65.89% and 66.45% with 20%MH ranking the same (P<0.05) with the control diet. The cost of feed to produce 1kg weight gain was highest in the control diet and lowest in 20%MH inclusion level, it was therefore concluded that melon husk can completely be used to replace maize at 20% inclusion level for optimum performance of rabbits.

Key words: Melon husk, growth, performance, digestibility, rabbits.

Introduction

Rabbit production is being promoted as a solution to increasing meat demand in Nigeria because of their sustainability to both large and small production (Cheeke, 1984). Rabbits have edge over many farm animals in that they can utilize conventional monogastric diets which are of low benefit to ruminants and also utilize highly fibrous diets which are of little benefits to monogastric animals. The source for non-conventional and cheaper feed resources by nutritionist as a substitute to reduce the high cost of conventional feed resources for livestock is now been advocated. Melon is a widely cultivated plant in Nigeria because of the seeds used as condiments in stew and soup. After harvesting, husks of melon are usually discarded or burnt after removal of the melon seeds (Obe and George, 2012). Harnessing crop residues such as melon husks which is not directly utilizable by man, can however, be a potential feed source in reducing feed cost in rabbit production. Therefore, this study aimed to investigate into the performance characteristics of rabbits fed melon husk diets as a replacement to maize.

Materials and methods

The experiment was carried out for 8 weeks at the Rabbitry unit of the Teaching and Research Farms, Federal University of Agriculture, Abeokuta, with twenty-four 8 weeks old Chinchilla mixed breed of rabbits. Average initial live weight of the rabbits was 570g. The rabbits were randomly divided into three groups of 8 rabbits with each treatment replicated four times with two rabbits per replicate based on weight equalization. The test ingredients; melon husk were obtained from Idere Village in Ibarapa Central Local Government area of Oyo State and sun dried. They were milled at 0%, 10% and 20% inclusion levels as replacement to maize with other feed ingredients (Table 1) to compound the experimental diets. Feed was supplied every morning at an average of 100g per animal while water was supplied *ad libitum* throughout the experimental period. Diets were weighed and offered on a daily basis, with the daily refusals collected to determine the daily intake. Pre-experimental weight of the rabbits was taken and at weekly intervals to determine the weekly weight changes. For the digestibility trials, two rabbits from each treatment at one per replicate were arranged in a clean and disinfected metabolic cage at the eighth week of the experiment. Adjustment period of 4 days were allowed, followed by a faecal collection of 4 days. Faecal samples were oven dried for analysis. Samples of melon husk and experimental diets were also pooled, labeled, stored, and then analyzed for proximate composition (AOAC, 1995). Feed cost analysis was carried out at the end of the experimental period to assess cost evaluation of the diets in relation to the performance of the rabbits using the method described by Afolayan *et al.* (2002). All data were collected and analyzed using one way analysis of variance (SAS, 1999) and significant means were separated using the Duncan multiple range test in the same package.

Results and discussion

The proximate composition of melon husk (MH) compared favourably with maize except in crude fibre, ether extract and ash (Ketiku, 1973). The values obtained for MH in this study were however in variance with the reports of Obe and George (2012) which could be attributed to the species of water melon, agronomic characteristics and method of processing. The crude protein content of the experimental diets ranged from 16.98 and 17.25% while fibre content were considered normal given that rabbits could tolerate high dietary fibre levels in the diet (Adegbola *et al.*, 1985). Although, the role of fibre in rabbit nutrition is not limited to nutrient supply, it plays a major role in the regulation of rate of passage of

Table 1: Percentage composition of experimental diets

Ingredients	0% MH	10% MH	20% MH
Maize	45.00	35.00	25.00
Melon husk	0.00	10.00	20.00
Soybean meal	16.00	16.00	16.00
Fish meal (72%)	1.00	1.00	1.00
Wheat Offal	32.50	32.50	32.50
Bone meal	3.00	3.00	3.00
Oyster shell	2.00	2.00	2.00
Premix	0.25	0.25	0.25
Common salt	0.25	0.25	0.25
Total	100.00	100.00	100.00

Table 2: Chemical composition (%) of experimental diets fed to rabbits

Parameters	0% MH	10% MH	20% MH	MH
Dry matter	89.72	89.78	89.68	90.08
Crude protein	17.95	17.18	16.98	9.52
Crude fibre	9.89	10.60	10.87	19.01
Ash	8.33	8.24	8.15	15.70
Ether extract	4.36	4.64	4.69	17.75
Energy (MJ/kg)	3.114	3.118	3.123	2.506

Table 3: Performance characteristics of growing rabbits fed melon husk based diets

Parameters	0% MH	10% MH	20% MH	SEM
Feed Intake/rabbit/day (g)	86.82 ^{a}	80.96^{b}	80.39^{b}	0.18
Initial weight (g)	570.00	568.00	571.00	0.76
Final weight (g)	1250.00	1168.00	1206.00	3.55
Weight gain (g)	680.00	600.00	635.00	5.51
Average daily weight gain (g)	12.14^{a}	10.70^{b}	11.34^{ab}	0.47
Feed conversion ratio	6.99^{b}	7.75^{a}	7.35^{ab}	0.65
Cost of feed (N/kg)	175.87^{a}	165.89^{ab}	154.04^{b}	1.02
Cost of feed/weight gain (N/kg)	0.26^{a}	0.27^{b}	0.24^{a}	0.02

^{abc} *means on the same row with different superscript are significantly different (P<0.05)*

Table 4: Nutrient digestibility of melon husk based diets fed to growing rabbits

Parameters	0%MH	10%MH	20%MH	SEM
Dry matter	95.65^{a}	93.13^{b}	95.05^{ab}	0.04
Crude protein	66.45^{a}	65.89^{b}	66.32^{a}	0.03
Crude fibre	78.42^{b}	79.03^{ab}	79.46^{a}	0.05
Ether extract	67.86^{b}	68.19^{a}	67.72^{c}	0.04
Ash	73.96^{b}	79.25^{a}	79.36^{a}	0.04

^{abc} *means on the same row with different superscript are significantly different (P<0.05)*

digesta, the control of gut flora and maintenance of intestinal mucosa integrity (De Blas and Wiseman, 2010). So, fibre is essential to maintain gut health, stimulate gut motility, and reduce fur chewing (Irlbeck, 2001).

Results on the performance indices and economic benefits of rabbits fed MH based diets are shown in Table 3. The values (80.39 to 86.82g/day) obtained for feed intake in this study were within range reported by earlier authors in rabbits fed various crop residues (Onifade and Tewe, 1993; Osakwe and Nwose, 2008). The relatively high feed intake noticed in the experimental rabbits fed on the control diets compared to other treatments could be attributed to palatability of the diet over those of melon husk based diets. There was however no difference in daily feed intake of rabbits fed MH diets. The average final weight gains of animals on the different feed treatment were not significantly ($P>0.05$) different from each other. The highest value 1250g was recorded by animals in 0%MH inclusion followed by 20%MH inclusion with 1206g while 10%MH inclusion levels recorded the least values of 1168g, respectively. The average weight gain (g/day) ranged from 10.70 to 12.14 and varied significantly ($P<0.05$) across treatments with weight gains in rabbits on the control treatment been statistically the same ($P>0.05$) with rabbits on 20%MH. The least ($P<0.05$) value (10.70) was recorded in rabbits fed 10%MH. The weight gains (g/day) of rabbits fed the experimental diets were low but conformed to the general trend in rabbits observed in developing countries (Esonu and Udedibie, 1993, Etchu *et al.*, 2014).

Significant ($P<0.05$) differences were observed on the dry matter (DM) and crude protein (CP) digestibility in rabbits fed the experimental diets. Rabbits fed MH diets have lower DM and CP digestibility values than the control diets. The digestibility coefficient of DM and CP in MH diets increased ($P<0.05$) with increasing level of MH in the experimental diets. The crude fibre digestibility values between 10% and 20%MH inclusions were not different ($P>0.05$), so also was the crude fibre digestibility values between 0% and 10%MH inclusion. However, the crude fibre digestibility differed ($P<0.05$) in 0% and 20%MH inclusion level. The rabbits fed different experimental diets did not have any definite pattern obtained with increased MH inclusion except for ether extract digestibility of 67.72% to 68.19%. The value obtained in 10% diet was the highest. Santoma *et al.*, (1987) observed a significant increase in ether extract digestibility as fat level increased without any significant difference between the fat sources. Ash digestibility values recorded a significant ($P<0.05$) difference between 0% melon husk inclusion diets and MH based diets. Meanwhile there was no significant ($P>0.05$) difference in ash digestibility values at 10% and 20%MH inclusion level in the diets. The high values of ash digestibility, observed in animal fed experimental diets suggested that essential minerals as calcium and phosphorous were not well utilized by the experimental rabbits. The feed cost\ kg (N) which reduced steadily from N170.87 in the control to N164.14 in 20% MH based diets suggest that 20% MH inclusion in the experimental diets is more economical than the other diets. It was however obvious from the study that 20%MH diet supported the least cost per kg weight gain than other dietary treatments.

Conclusion

The conclusion from this study was that growing rabbits could be fed diets containing 20% melon husk diets to enhance daily weight gain and reduce feed cost. The use of melon husk as shown in this study can be exploited so as to fashion out ways of reducing the hardship of feedstuff competition and rising cost of conventional feeds in rabbit production.

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