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Feed Preferences and Feeding Habit of Grass Cutters in Captivity; Case of J. J. Musa Farm

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Abstract

The study was carried out to investigate feed preferences and feeding habit of grasscutters in captivity at J. J Farms, a smallholder in Negetavah, Abuja Phase II Jalingo Local Government Area of Taraba State. The variables considered for the experiment include; feed conversion ratio, feed intake, body weight (kg), weight gain (kg) and average daily gain (ADG). Twenty (20) grasscutters were procured, and stocked at a density of (1 male: 4 females) per cage for the study. The feeds were; 50kg of paddy rice, 50kg of maize, 50kg of cassava and 50kg of sweet potatoes. Twenty (20) weaned grasscutters of 2-3 months old were randomly allotted to the four (4) experimental diets. Completely Randomized Design (CRD) was carried out for a period of 16 weeks. Twenty (20) weaned grasscutters, of 2-3 month old, were randomly assigned into cages A, B, C and D. Four (4) treatments diets consisting of paddy rice, maize, cassava and sweet potato were administered. Comparing day and night feeding of the grasscutters, effect of feed utilization on growth rate and cost-benefit ratio of grasscutter production showed that grasscutters fed diet on paddy rice was most preferred at night (112.60 kg) compared to the same diet paddy rice fed during the day (76.85kg), followed by sweet potatoes, (96.80 kg), then cassava, (81.35kg) and the least was maize (73.55kg). In terms of feeding habit, grasscutters fed more in the night than in the day. Maize (4.23kg) had more effect in terms of weight gain on feed utilization, while paddy rice (3.11kg) had the least weight even though it was the most preferred diet. On the financial standpoint on cost-benefit ratio of grasscutter production, cassava was the most economically profitable diet because it showed some corresponding significant weight gain in the animals. In conclusion, of every ₦1.00k investment made in the grasscutter business being fed with cassava, there was ₦3.39k yield in return and thus considered adequate for the growth of grasscutters**.** Application of Smart tech solution in studying feed preferences and feeding habit can help improve targeted feed, diagnostics, and variable rate technology to optimize the use of scarce resources, reduce costs and improve animal health and growth rate performance. Smart tech and data analytics, smart farm management systems using robotics and automation can apply cloud-based ICT solutions to support precision feeding and enhance animal performance, health and productivity.

Keywords: feed preferences; feeding habit, grass cutters, captivity, smart tech

Introduction

The grasscutter (*Thryonomys swinderianus T,)* is a non-ruminant wild herbivorous rodent which belongs to the class mammalian and orderrodentia. It originates from Africa. The grasscutter is found in the sub-Saharan Africa wherever the grass species they prefer for food are located. Captive rearing of the grasscutter has been identified as a potential source of income and employment and an important source of animal protein for both rural and urban people. The intake of animal protein of an average adult in the sub-region is estimated at15% of the total per capita protein intake as against average intake of55% for his European counterpart. This is below the recommended minimum daily protein requirements of 70-80 g of which 50% should be of animal origin (Akinnusi, et al; 2009).

Grasscutter farming in Nigeria has been gaining a lot of popularity because of its low capital input. The meat is a delicacy and there is no taboo against the rearing and consumption of grasscutter meat. The meat qualities of the grasscutter compared favourably with those of domesticated livestock species. The mature live-weight is 5 – 8kg with an average dressing percentage of 65% (Adeola, 2002).

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The meat has low cholesterol and fat contents (Fayenuwo et al; 2003).One of the major factors that affect livestock production is the cost of feeding which constitutes about 70 – 80% cost of production (Omole et al; 2007). Grasscutters can utilize high fibrous feeds like the rabbit. Both can utilize cellulose or fibre fraction of the feed more than poultry (Asibey and Addo, 2000).Grasscutters farming has social acceptability, good meat quality of high biological value (high protein and low fat), inexpensive feeds and amenability to captive rearing, good litter size and short generation interval. Despite the challenges of domestication of grasscutters, non-steady supply of the meat, air pollution and ecological devastation as a result of bush burning to hunt cane rats and threat to extinction of grasscutters; the domestication and production of grasscutters is another dimension in the livestock industry that has the potential to ensure regular and sustainable animal production in the nation (Adekola and Ogunsola,2009).The key to successful grasscutter (*Thryonomys swinderianusT,*) domestication is proper feeding combined with good health and maintenance measures. The animal is biologically efficient in converting forage and other nutrient deficient feedstuffs into meat. They are prolific animals feeding on several feed stuffs, trying to feed the grasscutters with agricultural by products like paddy rice, maize, sweet potatoes and cassava is to know their most preferred feeds so as to reduce cost of feeds.

With ever increasing human population and obvious protein shortage in Africa, high demand for animal protein by the ever increasing human populations, the need for increased animal protein in human diets is important. The high demand for grasscutters meat and the economic benefit that accrues from its sale, high cost and inadequacy of supply of feed pose a challenge to sustainable intensive production.

Animal production in the tropics is adversely affected by the high cost and inadequate feed supply. Nutrition and feeding is one of the technical aspects in grasscutter husbandry in captivity. Thus, the establishment of the nutritional requirements of grasscutter under captivity according to the physiological stages and defining the feeding system is crucial in the domestication processes of this species.

Rearing grasscutters in Nigeria in this type of space is one of the best ways to earn money in millions. This study was therefore designed to determine the feed preference and the feeding habit of grasscutters with respect to feed intake, weight gain associated with the grasscutters fed with rice, maize, cassava and sweet potato as the only source of carbohydrate in the diets.

Materials and Methods

The study was carried out at Mr. J.J. Farms, Opposite Government Day Secondary School Nagetavah, Abuja Phase II Jalingo, located at latitude 08^{0}55' 49.5"N and longitude 011^{0}21' 25.3"E (Oruonye, 2015).The experiment lasted for sixteen weeks which begun on 12ndFebruary, 2019 to 2nd May, 2019.Four treatments diets which consisted of paddy rice, maize, cassava and sweet potatoes as the only source of their diet. The percentage compositions of the diets are shown in Table 1.

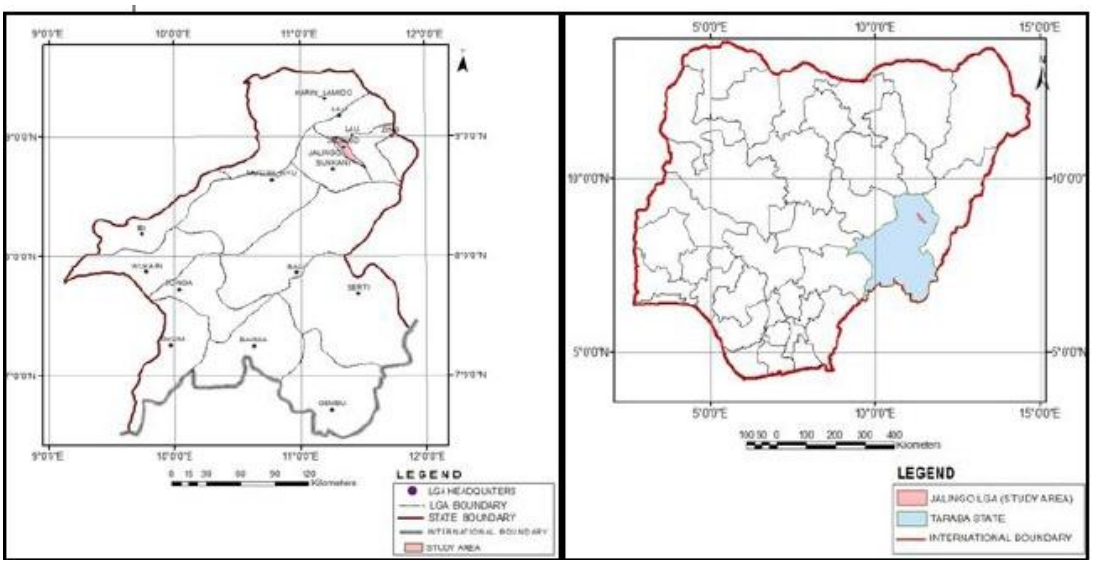

Figure 1: Map of Nigeria Showing Taraba State and Study Area

Experimental Diets

The experimental diet was formulated to supply20.15%, 19.45%, 19.10% and 20.00% crude protein, 20.22%, 18.86%, 17.61% and 18.52% crude fibre, and2675kcal ME/kg, 2850kcal ME/kg, 2780kcal ME/kg and 2900kcal ME/kg Diet1 (Paddy rice), Diet 2 (Maize), Diet 3 (Cassava) and Diet 4(sweet potatoes) were the main source of carbohydrate and energy in the diet.

The gross composition of the experimental diet is shown in Table 1 while the proximate composition, which was determined using the Association of Official Analytical Chemist (AOAC, 2006).

Table 1:Composition of experimental diets.

Ingredients	Diet 1	Diet 2	Diet 3	Diet 4
Paddy rice	55			
Maize		55		
Cassava			55	
Sweet potatoes				55
SBM	20.00	20.00	20.00	20.00
Groundnut Cake	18.00	18.00	18.00	18.00
B/M	5.00	5.00	5.00	5.00
Vitamin/ Mineral Premix	0.50	0.50	0.50	0.50
L-lysine	0.30	0.30	0.30	0.30
Dl- methionine	0.30	0.30	0.30	0.30
Salt	0.40	0.40	0.40	0.40
Palm oil	0.50	0.50	0.50	0.50
Total (%)	100	100	100	100
Calculated composition				
ME(Kcal/kg)	2675	2850	2780	2900
CP (%)	20.15	19.45	19.10	20.00
CF (%)	20.22	18.86	17.61	18.52

Grasscutters and Experimental Design

Twenty (20) weaned grasscutters, of 2-3 month old, were randomly assigned into cages A, B,C and D fed with the four treatments diets which consisted of paddy rice, maize, cassava and sweet potatoes as the only source of their diet.. Completely Randomize Design (CRD) was adopted for the experiment as described by Akindele (2004).The grasscutters were housed in concrete pens facing North-South direction to avoid excessive penetration of sunlight and consequent heat stress. The floors of the pens were cleaned daily, water and feed troughs were also washed daily, beddings were changed at 3 days interval to maintain optimum sanitation and health status (Akuru, et al., 2016)).

Management of Experimental Animals and Data Collection

The grasscutter pens were washed and disinfected two weeks prior to the arrival of the animals. Medication was given to the grasscutters by a Veterinarian. Feed and water were offered *adLibitum as* directed by Akuru, et al.,(2016). The weight of the feed offered minus the weight of left over feed was recorded as the daily feed intake. Comparing the day and night feeding of the grasscutters; the four (4) feeds were allotted to the grasscutters in cage A, B, C and D, respectively, in the morning at 7am and leftover collected and weigh at evening at 6pm, for the day feed intake and fresh feeds given at 7pm and left over collected at 6am in the morning, to compare day and night feeding of the grasscutters.

In determining the effect of feed utilization on growth rate, the grasscutters were weighed at the beginning of the experiment to obtain their initial body weights, and subsequently on weekly basis to determine their growth performance. The animals were finally weighed at the end of the experiment to determine their final live weights. Feed conversion ratio was calculated from these data as quantity (gram) of feed consumed per unit (gram) weight gained over the same period. The cost-benefit ratio (CBR) was determined by taking into account the amount of monetary gain realized by performing a project versus the amount it costs to execute the project.

Statistical Analysis of Data

Data were analyzed using the One way analysis of variance (ANOVA) in a completely randomized design (CRD) with the statistical package for social science (SPSS)version 20.0 (SPSS, 2007). A simple regression analysis was used to determine the Significant between individual diets and their respective weight gained.

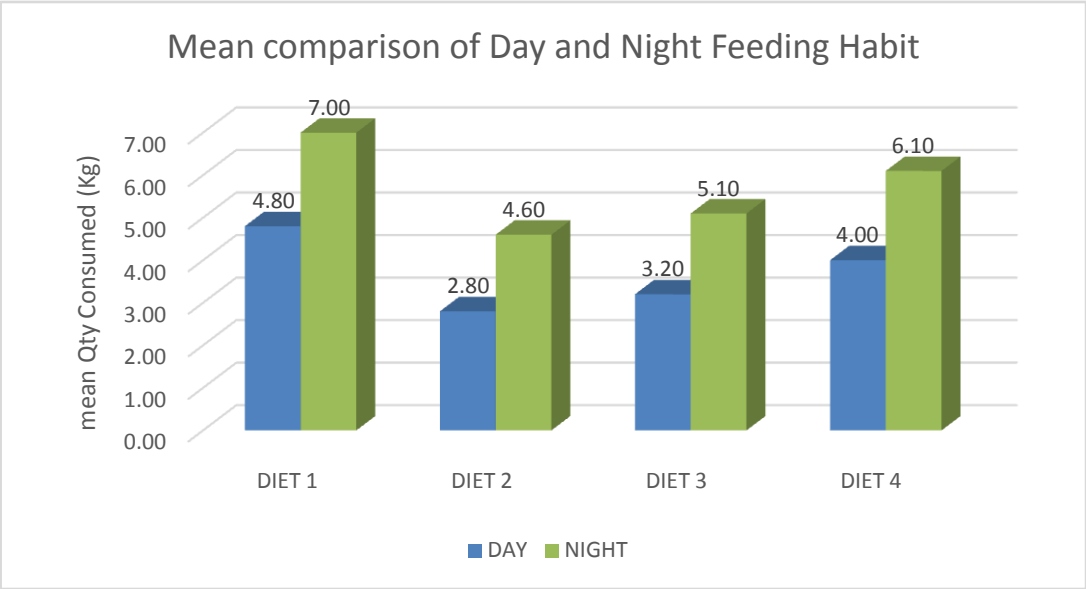

Figure 1: Mean comparison of Day and Night Feeding Habit

Results

Determine the feed preferences and feeding habit of grasscutters in captivity:

Comparing the day and night feeding preferences and habit of the grasscutters of the experimental diets are shown in figure 1. Table 2 shows the effect of feed utilization on growth rate of the grasscutters. The result shown that grasscutter fed diet on paddy rice was most preferred at night (112.60 kg) compared to the same diet paddy rice fed during the day (76.85kg), followed by sweet potatoes, (96.80 kg), then cassava, (81.35kg) and the least was maize (73.55kg). In terms of feeding habit, grasscutters fed more in the night than in the day. Maize (4.23kg) had more effect in terms of weight gain on feed utilization, while paddy rice (3.11kg) had the least weight even though it was the most preferred diet.

Table 2:Day and Night feed preferences and feedings habit of Grasscutters

	DIET 1			DIET 2			DIET 3			DIET 4		
WEEKS	DAY	NIGHT	WEIGHT GAIN	DAY	NIGHT	WEIGHT GAIN	DAY	NIGHT	WEIGHT GAIN	DAY	NIGHT	WEIGHT GAIN
1	4.75	7.20	0.10	2.35	4.25	0.25	2.60	4.40	0.15	3.70	6.35	0.15
2	4.60	7.25	0.15	2.45	3.75	0.25	2.80	4.70	0.20	3.70	6.30	0.15
3	4.65	7.25	0.20	2.50	4.60	0.30	2.90	4.90	0.25	3.70	6.15	0.25
4	4.65	7.50	0.20	2.55	4.90	0.20	2.95	5.35	0.15	3.80	6.00	0.15
5	4.65	7.25	0.10	2.60	4.60	0.30	3.05	4.85	0.20	3.90	6.20	0.20
6	4.70	7.00	0.15	2.60	4.75	0.20	3.05	5.45	0.15	3.95	6.10	0.15
7	4.70	6.95	0.20	2.65	4.35	0.20	3.05	5.15	0.15	3.95	6.15	0.20
8	4.80	6.90	0.15	2.70	4.60	0.25	3.15	5.00	0.20	4.05	5.80	0.20
9	4.85	7.10	0.20	2.75	4.45	0.20	3.20	4.60	0.20	4.10	6.10	0.20
10	4.85	7.05	0.15	2.75	4.35	0.20	3.25	5.10	0.15	4.10	6.30	0.15
11	4.85	6.95	0.10	3.05	4.40	0.20	3.35	5.20	0.15	4.10	5.95	0.15
12	4.90	7.00	0.20	3.05	4.75	0.25	3.35	5.80	0.20	4.15	5.80	0.20
13	4.95	6.80	0.15	3.10	5.15	0.20	3.35	5.00	0.15	4.15	6.25	0.15
14	4.95	6.80	0.20	3.15	4.45	0.20	3.35	4.75	0.15	4.15	5.70	0.20
15	4.95	6.90	0.15	3.20	4.90	0.25	3.45	5.45	0.20	4.20	5.75	0.15
16	5.05	6.70	0.15	3.30	5.30	0.20	3.70	5.65	0.15	4.50	5.90	0.15
Total	**76.85**	**112.60**	**3.11**	**44.75**	**73.55**	**4.23**	**50.55**	**81.35**	**3.39**	**64.20**	**96.80**	**3.34**
Average	**4.80**	**7.04**	**0.19**	**2.80**	**4.60**	**0.26**	**3.16**	**5.08**	**0.21**	**4.01**	**6.05**	**0.21**

Table: 3 Performance of Grasscutters Fed Different Source of Energy Based Diets

	Treatments			
Parameters	**Diet 1**	**Diet 2**	**Diet 3**	**Diet 4**
Average Initial Weight(kg)	0.56	0.58	0.59	0.54
Average Final Weight(kg)	3.11	4.23	3.39	3.34
Average weight gain(kg)	2.55	3.65	2.80	2.80
Average weight gain (g/h/d)	4.55	6.52	5.00	5.00
Total feed intake (kg)	37.89	118.30	131.00	161.00
Average feed intake (g/h/d)	338.30	211.25	233.93	287.57
Feed conversion ratio	74.35	32.40	46.79	57.50
Feed cost/kg diet (₦)	200	140	120	120
Feed cost/kg weight gain (₦)	2,971.76	907.51	1,122.86	1,380.00
Total feed cost (₦)	7,578.00	3,312.40	3,144.00	3,864.00
Standard Error Mean (SEM)	**0.20**	**0.18**	**0.18**	**0.18**

KEY: Diet 1= Rice, Diet 2= Maize, Diet 3= Cassava, Diet 4= Sweet Potatoes

The effects of feed utilization on growth rate of the grasscutters of the experimental diets are shown in Table 3. The result shows the growth performance of grass-cutters fed diets containing paddy rice, maize, cassava and sweet potatoes. There were significant differences ($p < 0.05$) among treatments in final and cumulative bodyweights. Grasscutters on diet 3 (cassava) had significantly higher ($p < 0.05$) final and cumulative body weights than those on the other treatments. The final and cumulative body weights of grasscutters on diet 2 and 4 (maize and sweet potatoes) were also significantly higher ($p < 0.05$) than those of grasscutters fed diet 1 (paddy rice) whose final and cumulative body weights were significantly ($p < 0.05$) lower than those on the other diets. The daily weight gain of grasscutters on diet 1 was significantly lower ($p < 0.05$) than those on the other treatments, with diet 2 having the highest average weight gain. Although, grasscutters on diet 1 had the least feed intake, it was not significantly ($p > 0.05$) different from the feed intake of grasscutters fed treatment 3. The feed intake of grasscutters on treatment 4 was higher ($p < 0.05$) than that of those on the other treatments. The feed conversion ratio values differed significantly ($p < 0.05$) across the various diets in the treatments with grasscutters on diet 2 having the least FCR value, while grasscutters on diet1 had the highest FCR value.

Benefit Cost Ratio of the Production

Table: 4a Cost Benefit Analyses of Grasscutters Fed on Rice, Maize, Cassava and Sweet Potatoes

Parameter	**Diet 1**	**Diet 2**	**Diet 3**	**Diet 4**
Total feed intake	189.45	118.30	131.00	161.00
Average feed intake	338.3	211.25	233.93	287.50
Feed conversion ratio	74.35	32.40	46.79	57.50
Feed cost/kg diet(₦)	200	140	120	120
Feed cost /kg weight gain (₦)	2,971.76	907.51	1,122.86	1380.00
Total feed cost(₦)	**7,578.00**	**3,312.40**	**3,144.00**	**3,864.00**

The result in Table 4a of cost-benefit analyses of grasscutters fed on rice, maize, cassava and sweet potatoes shown that, a total feed cost of ₦ 7,578.00 was spend on diet 1 (paddy rice) as the highest amount spend, diet 3 (maize) was the least amount spend which costs ₦ 3,144.00 a little bit lower than costs of diets 2 and 4. Therefore, since cost-benefit ratio (BCR) takes into account the amount of monetary gain realized by performing a project versus the amount it costs to execute the project.

Table 4b: Summary cost-benefit analyses of Animals fed on Diet 1, Diet 2, Diet 3 and Diet 4.

	DIET 1	**DIET 2**	**DIET 3**	**DIET 4**
TOTAL COST (VC + FC)	7,578.00	3312.40	3144	3864
Total benefit (unit price × quantity)	2500 X 5 =12,500	2500 X 5 =12,500	2500 X 5 =12,500	2500 X 5 =12,500
Benefit Cost Ratio	**1.65**	**3.77**	**3.98**	**3.23**

VC = Variable Cost FC = Fixed Cost

The summary of cost-benefit analyses of Animals fed on Diet 1, Diet 2, Diet 3 and Diet 4, from the financial stand point, as shown by the analysis above, Diet 3 is the most economically profitable diet. This is because, with this diet, every ₦1 invested in the grasscutters business will yield ₦3.98 in return. This means that the higher the cost-benefit ratio the better the investment. Hence, the general rule of thumb is that if the benefit

is higher than the cost this means the project is a good investment as shown in graphical representation in figure 2.

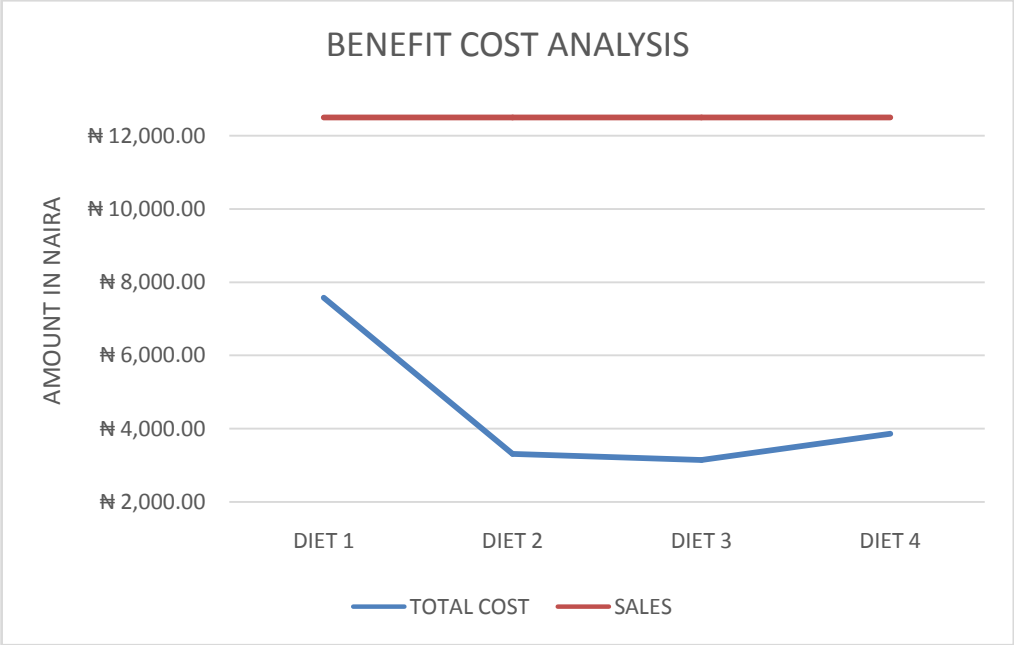

Figure 2: Graphical presentation of Cost-Benefit Analysis on Diets 1, 2, 3 and 4

Discussion

As shown in Table 2, comparing feed preferences and habit of grasscutters in day and night, the findings revealed that grasscutters fed diet on paddy rice was most preferred at night (112.60 kg) compared to the same diet paddy rice fed during the day (76.85kg), followed by sweet potatoes, (96.80 kg), then cassava, (81.35kg) and the least was maize (73.55kg). In terms of feeding habit, grasscutters fed more in the night than in the day. Maize (4.23kg) had more effect in terms of weight gain on feed utilization, while paddy rice (3.11kg) had the least weight even though it was the most preferred diet. According to Ani and Okeke (2011) the diet (paddy rice) is most preferred by the animals because is the diet that is digested rapidly, and are also of high digestibility promotes diet high intakes. The faster the rate of digestion the more rapidly are the digestive tract emptied and the more space is available for the next meal. The feeds was taken more in the night than in the day was because according Ikpeze and Ebenebe (2004) observed that housing grasscutters in concrete pens facing North-South direction help to avoid excessive penetration of sunlight and consequent heat stress this stimulate nocturnal feeding habits of grasscutters, and provide hiding places for the animals when frightened. Generally, diet 2 (maize), diet 3 (cassava) and diet 4 (sweet potatoes) were fed more in the night than day times. As shown in Table 3, feed intake was lowest (211.25g/h/d) among grass-cutters fed maize meal (diet 2). Obi *et al.* (2008) reported that crude fibre content of a diet usually affect feed consumption, invariably, the higher the crude fibre of the feed, the lower the feed consumed. Furthermore, animals depend mostly on the nutritional value of the feed and not on the quantity of the feed consumed.

From the data for the effect of feed utilization on growth rate of the grasscutters of the experimental diets (Table 3), treatment 1 diet had the highest crude fibre content and this probably may have impacted on the feed intake of grasscutters on that diet. According to Omole, et al., (2007), high dietary fibre resulted in the limitation of the amount of energy available to poultry birds with consequent increase in the amount of nutrients excreted. Lee *et al.* (2003) reported that inclusion of fibre in the diets of monogastrics like poultry species has been discouraged owing to the negative effect it has on performance and nutrient utilization. This was a proved for the study because more of paddy rice was consumed by the animals with corresponding low weight gained.

Numerical differences were observed for total feed intake and average feed intake in Table 3, between the diets in the treatments. For example, the study revealed diet the lowest average feed intake of the animals was recorded in diet 1 (37.89kg), and the maximum feed intake was recorded in diet 4 (161.00 kg), followed by diet 3 (131.00 kg), and diet 2(118.30 kg) respectively.

On weight gained, grasscutter with initial body weight of 0.56kg had different body weights of 3.11 kg, 4.23kg, 3.39kg and 3.34kg for diets 1, 2, 3 and 4 respectively. These differences found to be significant ($P< 0.05$) between diet 2 and those of 1, 3 and 4.

Total weight gained and average weight gained also followed the same trend, obviously due to differences in final weight gained. Etchu., Ndzi Ndamukong and Oben (2012) supported this trend of performance in their comparative studies they observed that in mean total weight gain and daily weight gain follows the reverse of the trend of crude fibre content of the treatment diets but similar to that of the crude protein content of the treatments. The high fibre levels and low crude protein content of rodent pellets and maize compared to that of rodent pellet combined with maize might have caused the reduction in performance. An increase in fibre levels in the diet of grasscutters has been found to be associated with a decrease in the digestibility of dry matter, protein and fat in these animals leading to reduction in growth rate. Studies in grasscutters have also shown this positive relationship between amount of protein in grass and dry matter digestibility.

Feed conversion ratios recorded in the study (Table 4a) is significant (P> 0.05) for diet 2- fed animals. Grasscutters fed diet 1 which contained paddy rice had the highest feed intake (338.30 g/h/d) and feed conversion efficiency. This translated higher average weight gained (6.52g/h/d). Grasscutters fed diet 2 (maize) recorded a relatively lower feed intake and feed conversion efficiency but highest weight gained (4.23Kg).Fayenuwo, et al., (2003). Assert that this could be due to the fact that maize is relatively very low in its crude fibre contents which the animals make maximum use of than any other feed component, thus the higher metabolisable energy exhibited by the maize was not fully utilized by the grasscutters just due to the simple fact that they can perform more on a low calorie feed.

On cost-benefit analysis, the result showed feed cost/kg ranged from ₦42.32 to ₦67.82k, feed cost/kg gained ranged from ₦120.00/kg to ₦200.00k/kg as presented on Table 4a. The profitability of feeding the experimental diets to grasscutters were not significantly (P>0.05) different. Diet 3 had the lowest value and Diet 1 had the highest value for feed cost/kg. The feed cost/kg weight gain was lower in Diet 2 and highest in Diet 1. Highest feed cost/kg gain recorded in Diet 1 could be as a result of high cost of paddy rice and the high inclusion in the diet of the animals.

The cost-benefit is the ratio of the benefits of a project or proposal, expressed in monetary terms, relative to its costs, also expressed in monetary terms. The summary of cost-benefit analyses of Animals fed on Diet 1, Diet 2, Diet 3 and Diet 4 was showed in Table 4b as 1.65, 3.77, 3.98 and 3.23 respectively. From the financial stand point, as shown by the analysis above, Diet 3 is the most economically profitable diet. This is because, with this diet, every ₦1 invested in the grasscutters business will yield ₦3.98 in return. This means that, the higher the cost-benefit ratio the better the investment. Hence, the general rule of thumb, states that if the benefit is higher than the cost this means the project is a good investment. Wogar, (2015) assert that a good understanding of the principles and techniques of production will lead to profitable grasscutter business. Thus with appropriate information regarding the prospects and possible challenges of grasscutter production, more farmers will engage in the production of grass-cutter. This will go a long way in alleviating poverty, reducing hunger, creating jobs, improving income and the immune system of Nigerians against diseases associated with low level of protein intake.

The issue on AI

Most livestock farmers are faced with the challenge of growing individual animals to a condition that matches market specifications and timing. To do this, they proactively manage nutritional inputs, including pasture availability, to achieve growth rate, composition and product quality.

But even farmers with many years' experience can struggle to predict an individual animal's yield potential and fat content prior to sale, with some estimates putting prediction accuracy as low as 20–30%."Having the technology to predict yield and fat at slaughter would be the ideal management tool, and would increase returns to farmers."

Some worked by RIRDC,(2016) with highly-skilled cattle assessors to visually grade muscle and fat as a starting point to develop his live-animal imaging device. "An animal deposits muscle and fat in different areas of the body, which results in different shapes. Humans do not perceive dimensions accurately but they are inherently capable of discriminating shape differences. The next step was to turn a shape, such as muscling, into a mathematical description and assign it a value." By calibrating the fat measurement via ultrasound and a muscle score determined by an expert assessor, the software uses the mathematical description to estimate an animal's condition based on the 3D shape the machine can "see".

Working in combination with other new technologies along the supply chain, including artificial intelligence directing autonomous machines to slice carcasses to maximize yield, the condition scoring technology will improve meat quality for consumers and increase returns to farmers.

Conclusion and Recommendations

The results obtained in this study show that paddy rice is the most preferred diet of the experimental animals while feeding habit is mostly in the night due to their nocturnal nature. The result also shows maize as diet that supported a high growth rate than paddy rice, cassava and sweet potatoes. It was therefore concluded that the maize diet could be used as complete diets for sustainable grasscutter production and thus considered adequate for growth of grasscutters in captivity. Livestock farmers use their experience and knowledge to judge when animals are ready for market, but this can be an unreliable measure of condition. But with artificial intelligence (AI) the farmer now through enabling computers have the ability to accurately predict an individual animal's yield potential at any point in time will transform livestock production and marketing. This will provide farmers and processors with real-time, transparent and accurate information to support decision-making in relation to individual animals. Diet 2 and Diet 3 can; therefore be used as sole diets for growing captive grasscutter. Diet 2 is particularly recommended to grasscutter farmers living in Taraba State where cereal crop such as maize abounds for feeding grasscutter especially during dry season. In terms of cost-benefit ratio of ₦ 1: ₦3.98 on maize as a diet, it is therefore recommended to retired civil servants and farmers to invest into the business of rearing grasscutters because it have good returns, cheap and available feeds for the animals. It is also recommended the study be repeated with a greater number of grasscutters and duration for higher growth rate.

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