Performance of Grasscutters (*Thryonomys Swinderianus*) Fed With Varying Composition of Compounded Feed

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Abstract: **This research compared the effect of different feed ration on growing grasscutters to obtain a compounded feed that is efficient in managing this rodent in captivity. Ten young grasscutters (2 months old) were weighed at the initial stage, put in five compartment cages (two animals in a cage) of equal dimension: 0.75 x 0.38 x 0.40 m (L x W x H). Completely Randomized Design (CRD) was used to allow the animals in their cages, labeled Treatments 1to 5 (T_1, T_2, T_3, T_4, and T_5). The animals were fed with varying percentages of compounded maize, millet, Guinea corn, sweet potatoes, cassava tubers with clean water, and forage every day for six months. The feeds used for each treatment were labeled F_1, F_2, F_3, F_4, and F_5 respectively. Data were collected weekly on body weight (kg) and length (cm) of the animals by the use of weighing balance and ruler respectively. The result shows that T_2 animals, fed with the highest percentage of millet were significantly higher ($P<0.05$) in both body weight and length, while T_4 animals fed with sweet potatoes have the lowest body weight and length. This work recommends improving grasscutter feed with millet flour for fast growth and agility.**

Keywords: **Body weight, Compounded feed, Cages, Domestication, Treatments**

I. INTRODUCTION

Grasscutter (*Thryonomys swinderianus*) is a member of the rodent family. Its meat is very much in demand in Nigeria as white meat and source of animal protein. To produce this animal more efficiently in captivity, there is a need to look into balanced nutrition as a major factor for mass production. Consequently, Conservationists (IUCN, 2008) recommend domestication of some wild animal species in high demand as bush meat to reduce pressure on the wild population

South Africa started this practice with the domestication of Buffalos *(Syncerus caffer)* and ostriches *(Struthio camelus)* among other animals which they recorded a huge success

(Ogunjobi *et al*, 2013), In Nigeria, the wildlife species with domestication potentials included the grasscutter (*Thryonomys swinderianus*), giant rat (*Cricetomys gambianus*), duikers (*Cephalophus monticola*) guinea fowl (*Numididae*), porcupine (*Erethizon dorsatum*) and African giant snails (*Achatina* spp) (Adebayo, 2008). Also, there has been large-scale domestication of crocodiles and other wild reptiles under semi in-situ conditions where the confined animals have limited access to their natural environment (Addo, 2002). Also, Karikari and Nyameasem, (2009) said that the popularity of wild animal domestication in the West African Sub-region is due to the importance of bushmeat as part of the staple diet. Since the human population is growing, African Center for Economic Transformation (ACET) in 2014 called for improvement on some of the wild animal species with domestication potentials in the West African Sub-region which include the grasscutter (*Thryonomys swinderianus*). Also, Ayodele and Meduna (2007), stated that it is essential to domesticate this animal in abundance. Grasscutter domestication started first in Nigeria at Ibadan in the year 2000, before spreading to other parts of Nigeria. There is a huge success in the domestication of this rodent, which is the biggest bush meat apart from a porcupine. (Adu,1999). This animal is found easily throughout Africa especially savanna forest vegetation (Ekenyem, Madubuike 2006). The mature adult can weigh 4-12kg.

Grasscutter naturally possesses all the essential features for survival such as good eyesight, sense of smell and orientation, swift movement at the sight of a man or strange objects which are not familiar to its habitat, sensitive hearing, high feeding ability and good reproduction ability (Adekola, and Ogunsola, 2009). This animal can cope with high temperature and humidity and it is not prone to many diseases (Casal, 2011). Grasscutter is an omnivorous animal and feeds on a variety of food items.

However, Nutrition in grasscutter is an act of providing balanced feed necessary for the healthy growth and nourishment of the animals. The three categories of nutrition in grasscutters are forage like elephant grass, agro-by products like tuber crops and cereals. Previous research by Meduna, (2014) shows that grasscutter prefers and perform better on formulated balanced feed. Appropriate nutrition is one of the major factors for every successful grasscutter farm. Grasscutter feed on vegetation and can convert the high celluloid material into valuable animal protein (Owen and Dike, 2012). Its feed ranges from tubers: cassava, yam, sweet potatoes including their peels (Okeke and Oruh, 2020), cereals: maize, millet, guinea corn, forage: elephant grass, sugar cane, water leaves, and pawpaw leaves. All these varieties of feed made it a success when domesticating or multiplying this animal in captivity. Thus, meat from

domesticated grasscutter serves as an alternative source of protein for many individuals, families, and groups. According to Onyeanusi *et al*, (2008) grasscutter domestication has been deterred by lack of improved breeding stock, inadequate technical know-how, poor feeding, and management practices.

II. MATERIALS AND METHODS

Location of the Study Site:

The study was vividly carried out in the grasscutter research farm of the Department of Forestry and Wildlife Resources Management, University of Calabar, Nigeria. The study area lies between latitude $4^0$93'08' and $4^0$93'10' North and longitude 8°33'81' and $8^0$33'92' East. The area is characterized by tropical rainforest climate with heavy annual rainfall ranging from 3,000 mm to 30,000 mm, with a relative humidity of 57.93%, and temperature ranging from 26°C in the dry season which lasts from October to February and 24^0C in the rainy season, which lasts from March to September (Wogar, 2013). The vegetation surrounding the study area consists mainly of swampy shrubs and grasses like elephant grass *(Pennisetum purporeum*), water lettuce (*Pistia stratiotes*), water lilies (*Nymphae anouchali*) and other unidentified shrubs. Scanty roadside trees like Teak *(Tectona grandis)* also surround the farm where the research building was elected. Other buildings that surround the area include the Department of Soil Science research building, Department of Animal Science research farm, and University of Calabar table water factory.

Experimental Animals and Diet:

Research grasscutters (either sex), two months old were purchased from the Weco grasscutter farm at Nkanu East, Enugu State, and bred for six months. The young grasscutters were obtained from three different parents but have the similarity of being the fourth generation of each parent. They were two months old (immediately after weaning). All the young animals were brown and of health condition. The perforated basket was used to transport them from Nkanu to Calabar, the research site. They were left in an open room for five days to relax from shock before the experiment. The compounded feed ingredients which include maize, millet, Guinea corn, sweet potatoes, cassava, vitamin premix, and bone meal was purchased from the Watt market Calabar, Cross River state while elephant grass and pawpaw leaves were obtained from vegetation around the research farm.

Experimental Technique

The ten young grasscutters were randomly allotted to five cages, labeled T_1, T_2, T_3, T_4, and T_5 using Completely Randomised Design (CRD) as an experimental design. Each cage has two animals and reared for six months with varying percentage of major feed ingredients that contains a high percentage of maize, millet, Guinea corn, sweet potatoes, and cassava and minor feed supplements of table salt, elephant grass, bone meal, vitamin premix, and water.

The five different compounded feed ration labeled (F_1, F_2, F_3, F_4, and F_5) were used to feed the five treatments respectively. The animals were fed three times a day at five hours interval: by 7 am, 12 noon, and 5 pm, according to the feeding regime of Ogogo, (2008). The animal cages were cleaned daily to ensure that the cages were hygienic and prevent diseases. Daily observation of the animals was done for the possible occurrence of diseases and sickness.

Data Collection

The weekly body weight (kg) and body length (cm) of the experimental animals were taken by the use of spring balance and ruler respectively. The average change in body weight and length were recorded and was used to determine the best feed ration for the animals. The experiment lasted for six months. The average data on body weight and length collected were represented on tables, graphs, and charts below.

III. RESULTS AND INTERPRETATION

Table 1 below shows the ingredients used in compounding feed for all the treatments. T_1 to T_5 animals were given feed that contains 80% of maize in F_1, 80% of millet in F_2, 80% of Guinea corn in F_3, 80% of sweet potatoes in F_4, and 80% of cassava in F_5 respectively and equal percent of other feed ingredients which was 2% table salt, vitamin premix, and water, 5% bone meal, elephant grass, and 4% pawpaw leaves.

Table 1:	Compounded Feed Ingredients (%)				
Feed Ingredients	F1	F2	F3	F4	F5
Maize	80	-	-	-	-
Millet	-	80	-	-	-
Guinea corn	-	-	80	-	-
Sweet potatoes	-	-	-	80	-
Cassava	-	-	-	-	80
Table salt	2	2	2	2	2
Bone meal	5	5	5	5	5
Elephant grass	5	5	5	5	5
Vitamin premix	2	2	2	2	2
Pawpaw leave	4	4	4	4	4
Water	2	2	2	2	2
Total	100	100	100	100	100

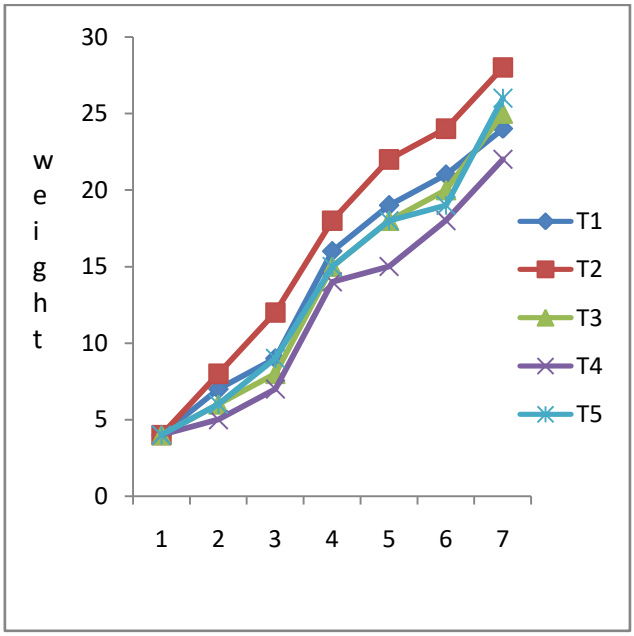
Table 2 below shows the mean monthly body weight (kg) and length (cm) of the five treatments. The total bodyweight of T_1 to T_5 was 10.19kg, 11.73kg, 9.9kg, 8.63kg, and 10.06kg respectively with corresponding mean monthly weight: 1.46kg, 1.68kg, 1.41kg, 1.23kg, and 1.44kg. Also the total body length of T_1 to T_5 were 357cm, 371cm, 355cm, 343cm and 358cm with its mean of 51cm, 53cm, 50cm, 49cm and 51cm respectively.

Table 2: Mean Monthly Body Weight (kg) and Length (cm)

	T1		T2		T3		T4		T5	
	W	L	W	L	W	L	W	L	W	L
	0.45	44	0.45	44	0.45	44	0.45	44	0.45	44
	0.70	50	0.82	51	0.68	48	0.50	45	0.69	49
	0.92	50	1.20	52	0.89	49	0.71	47	0.90	50
	1.66	51	1.84	53	1.57	51	1.40	50	1.59	52
	1.90	52	2.20	55	1.81	53	1.50	51	1.85	54
	2.10	54	2.42	56	2.00	53	1.86	52	1.95	54
	2.46	56	2.80	60	2.50	57	2.21	54	2.63	55
Total	10.19	357	11.73	371	9.90	355	8.63	343	10.06	358
Mean	1.46	51	1.68	53	1.41	50	1.23	49	1.44	51

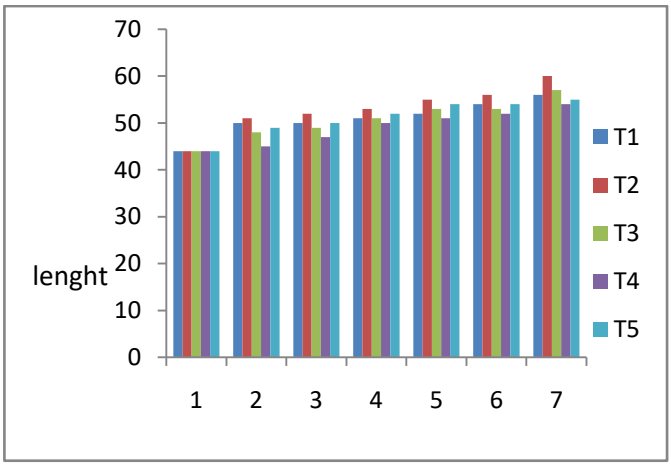
Figure 1 below shows the graph of the bodyweight of all the treatments. Treatment 2 (T_2) was the highest which demonstrated rapid growth, while treatment 4 (T_4) was the least. Treatment 1, 3, and 5 (T_1, T_3, T_5) have similar body weight and grows almost at the same rate.

Figure 1: Graph of body weight (kg) of grasscutter



Also, Figure 2 below demonstrated the body length of all the treatments. The first month shows an equal body length which means that the experiment was started with animals of equal body length. Other months indicated a rapid increase in the body length of treatment 2 animals (T_2) which was higher than all the treatments. Also, treatment 4 (T_4) has the least body length while treatments 1, 3, and 5 have similar body lengths.

Figure 2: Grasscutter growth in body length(cm)



IV. CONCLUSION AND RECOMMENDATION

The essence of this research was to find out the best ingredients that will be used to formulate feed for growing grasscutters in captivity. The result obtained has shown that a high percentage of millet should is good ingredients for food formulation. Other feed supplements like salt, protein premix, and forages when added in good proportion can be of advantage. Also, millet stock should equally be used as a fodder to improve their vitamin intake. This will enhance the growth of prolific healthy grasscutters that will be of profit to farmers, grasscutter rearers, and of more interest to youths and unemployed people. Therefore, it was recommended that feeding of captive grasscutters should be improved with millet flour that contains more nutrients that are efficient than other feed ingredients. that efforts must be made to breed captive grasscutter with adequate and balanced feed with high nutritional value.

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