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Factors influencing Grasscutter (*Thryonomys swinderianus*) Domestication in Rural Communities of Oyo State, Nigeria

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Abstract

This study investigated factors influencing grasscutter domestication in Oyo State. Multi-stage sampling procedure was used to select 110 respondents from 5 rural Local Government Areas of Oyo State. Interview schedule was used for data collection. Data was analysed using chi square, PPMC and multiple regression. Results showed that the majority (84%) of the respondents were male and married with mean age of 44±37.05 years. The mean household size was 5 persons and half (50%) of the respondents had secondary education. The most utilised source of labour was family (61%) and the average years of farming experience was 9.78±3.99 years. An average grasscutter farmer in the study area keeps 20 grasscutters with average monthly income of ₦36,000±11,045.36. Most (60%) of the farmers prefer to sell their produce directly to consumers while others (30%) did not mind selling at open market. Respondents (61%) had high knowledge about grasscutter production and half (50%) of them had favourable attitude towards grasscutter production. Benefits derived by farmers included increased income, resistance of animals to diseases and cost effectiveness. Result shows that age (β=-0.767), farming experience (β=0.955), income (β=1.102), benefits derived (β=0.273) and respondents' knowledge (β=0.644) all had significant relationship with domestication of grasscutters in the study area. The study recommends that farmers be further trained on the nutritional and economic benefits of grasscutter in the study area to encourage more farmers to be involved in the enterprise.

Keywords: Grasscutter, domestication, benefits, rural

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Introduction

Wildlife has great potentials for meat production and serves as an important source of the desired animal protein to people of Africa, both in urban areas and rural communities (Adu, Asafu-Adjaye, Hagan and Nyameasem, 2017). However, with ever increasing human population and obvious protein shortage in Africa, there is the need for an exploration of other means to provide readily acceptable meat on short term basis. Wildlife domestication has been recognized as a way of achieving this objective (Ajayi, 2010). Among the wild rodents, grasscutter or cane rat or cane cutter is the most preferred (Adu, *et al,* 2017). Grasscutter (*Thryonomys swinderianus*) is a wild hystricomorphic rodent widely distributed in the African sub-region and exploited in most areas as a source of animal protein. Being the most preferred and most expensive meat in West Africa including Nigeria, Togo, Benin, Ghana and Cote d'voire, it contributes to both local and export earning in most West African countries and is therefore hunted aggressively (Ibe, Ikpegbu and Nzalak, 2017). Unfortunately, its collection from the wild is attended by destruction of the environment through the setting of bush fires by hunters.

To alleviate this problem, attempts are being made in the sub-region to domesticate grasscutter and make it more readily available, gain economic benefit and also reduce the environmental destruction that accompanies its collection from the wild. For instance, a major research programme on grasscutter has been initiated in Benin Republic under the Project Benino-Allemandd'Aulacodiculture (PBAA) to select genetically improved grasscutter stocks adapted to life in captivity and to promote the rearing of the animal in rural and sub-urban environments. This can also be adopted in Nigeria if given proper consideration.

Grasscutter farming is profitable because of its social acceptability, meat quality, inexpensive feed sources and amenability to captive rearing, good litter size and short generation interval (Agbelusi, 2013). Grasscutter is a good source of animal protein of high biological value. Cane-rat meat has good nutritional qualities: high quality animal protein, low fat, high dressing percentage and good/unique taste (Unaeze, 2016). The cost of its establishment is low and grasscutters are hardy animals. Its domestication requires less space and less capital. It can be raised in backyards within limited space by landless farmers (Adu, *et al*, 2017).

Grasscutter "feeds" are not usually competed for as they range from green forages to kitchen wastes which can easily be obtained by the smallholder farmer compared to larger livestock which require large expanse of land and capital (Agbelusi, 2013). The markets for both fresh and smoked grasscutter meat, as well as its contribution are unlimited. In the wild, grasscutter eats a variety of feedstuffs ranging from green forages, grains to root and tuber crops. The feed of grasscutter in captivity must be well balanced in nutrients to

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enable the grasscutter not only to have good health but also perform maximally in terms of growth and productivity (Adu, *et al,* 2017).

Most rural farmers have access to capture cane rat on a daily basis. These farmers sometimes capture live animals but often times animals are trapped dead. Many individuals that love to rear grasscutter are faced with the challenge of technical know-how of handling animals, differentiating the breeds, feeds and housing methods to use on these animals. Over the years, the demand for grasscutter meat has been met through hunting from the wild which had always been done through the use of chase dogs, baiting with chemicals which has harmful effects on consumers and other untargeted species or by bush burning which mainly results in environmental hazards. In the wild, grasscutters multiply by themselves, but high demand for the meat has resulted in a decline in their numbers (Unaeze, 2016). Evidently, the future availability of grasscutter meat through these above-mentioned conventional means as well as its sustainability is questionable.

Mustafa, Akinyemi, Adewale, Odeleye and Abdulazeez (2015) found out that grasscutter domestication is now on the increase because the meat is known to be popular especially in South-Western Nigeria and thus producing them under domesticated conditions in higher numbers would be a good source of supplementing the country's inadequate protein needs which is dependent on conventional livestock (Cattle, Sheep, Goats, Pigs and Poultry). It has also been confirmed that the feasibility of rearing grasscutter in captivity would increase its litter size with good but cheap feeding. However, this initial interest and efforts did not result in the establishment of grasscutter farms and only a few people continued with the idea of back yard grasscutter farming. The waning support could be attributed mainly to the relatively large initial capital investment required, the lack of readily available breeding stock, problems of feed during the dry season and the many unresolved and poorly understood issues associated with diseases in captive grasscutters. Ijeomah, Ofodile and Okereku (2016) focused primarily on the challenges and prospects of domestic grasscutter production albeit little seem to have been done regarding other factors that could affect its production. Therefore, this study investigated the factors influencing the domestication of grasscutters in rural communities of Oyo State, Nigeria.

Objectives of the Study

The main objective of the study was to assess the factors influencing the domestication of grasscutters in rural communities of Oyo State, Nigeria. The specific objectives of the study were to: describe the socio-economic characteristics of grass cutter farmers in the area; ascertain the knowledge of respondents on grass cutter domestication; determine the attitude of respondents to grass cutter domestication; ascertain the benefits derived from grass cutter domestication; and determine the factors influencing domestication of grass cutter in the study area.

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Methodology

The study was carried out in Oyo State, Nigeria. It is bounded by Republic of Benin, Osun, Kwara and Ogun States and there are 33 Local Government Areas in the State. According to 2006 National population census, the population of the State stood at 5,591,589. It is located between latitudes 8.1^0 N and longitudes $3{\cdot}4^0$ E. It covers a total of 28, 249 square kilometers of land mass and it consists of old hard rocks and dome shaped hills with rivers and streams. Agriculture is the major source of income for greater number of people in the State providing food and shelter, employment, raw materials and remains an important source of internally generated revenue in the state. The climate of Oyo State is tropical with distinct wet and dry season with temperature ranging between 22-38^0C which favors the growth of food crops like yam, cassava, millet, maize, fruits, vegetables, plantains, cocoa and tobacco. Livestock like ruminant, poultry, fish and forest animals like grasscutter which also can be found in thick forest riverine areas are also found in the State. The state has two vegetation zones which are derived savannah and forest zones.

Multi-stage sampling procedure was used for the study. At stage one, purposive selection of 30% of the 17 rural LGAs where grass cutter production is prominent was done to give a total of 5 LGAs (Itesiwaju, Egbeda, Saki East, Atisbo and Saki West).

Stage two involves purposive sampling of two communities from each of the 5 selected LGAs due to prominence of grasscutter production, which are Ipapo and Baba-Ode from Itesiwaju L.G.A, Apeteere and Iyana Agbala Egbeda L.G.A, Ago-Amodu and Sepeteri from Saki-East L.G.A, Tede and Irawo from Atisbo L.G.A and Ilua and from Sannisala from Saki West L.G.A.

Stage three involved snowball sampling of 11 grasscutter farmers from each of the selected communities above to make a total sample size of 110 respondents.

Both quantitative and qualitative methods were used to obtain data from respondents. Well-structured questionnaire and interview schedule were used to determine respondents' socio-economic characteristics, knowledge, attitude, benefits as the independent variables and factors affecting grasscutter domestication in the study area as the dependent variable. Focus Group Discussion (FGD) was also conducted to further support data obtained from the quantitative methods. Data was analyzed using chi square, PPMC and multiple regression analysis.

Results and Discussion

Findings on personal characteristics of grass cutter farmers (Table 1) reveal that the majority (84%) of the respondents were male and married (94.4%) which is in tandem with the results of Aiyeloja and Ogunjimi (2013) that male are more involved in grasscutter farming than female. The mean age of respondents was 44±37.05years indicating that they were still in their active and productive age which could give them opportunity to

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explore the full potentials embedded in the domestication of grasscutter. Findings also revealed that the majority (83%) were Christians which implies that majority of respondents in the study area were Christians. The mean household size was 5±1.41 indicating that many of them had access to family support for their agricultural production. Unaeze (2016) confirmed that family labour provides help for agricultural production. Fifty percent of the respondents had secondary education and 16.3% had tertiary education. This implies that respondents' level of education is relatively high which could help them to appropriate information gotten on grasscutter farming as supported by Ogunjimi, Obaniyi and Adedeji (2012). Also, it was revealed that 50% of the respondents were traders and 28% of them were civil servants which suggest that respondents were engaged in other livelihood activities which could not allow them to explore the full benefits of rearing grasscutter as they could get income from another source. It was also gathered that the majority (72%) of the farmers belonged to farmers group. Focus Group Discussion report indicated that respondents belonged to groups like the Grass Cutter Farmers Association of Nigeria (67%) and All Farmers Association of Nigeria (AFAN) (5.6%) while 27% of the farmers did not indicate being members of any farmer group. The most utilised source of labour was family labour (61%) and the average years of farming experience was 9.78±3.99years indicating that the majority of the farmers had sufficient farming experience. An average grass cutter farmer in the study area keeps 20 grass cutters. The average monthly income of farmers was ₦36,000±11,045.36 indicating that the majority of the farmers are small scale farmers. Better training and involvement in the domestication of grasscutter could increase the income of farmers and provide employment as corroborated by Ijeomah, Ofodile and Okereku (2016).

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Table 1: Distribution of respondents on socio-economic characteristics

Variables	%	Mean	S.D
Sex			
Male	84.4		
Female	15.6		
Marital status			
Single	5.6		
Married	94.4		
Age (in years)		43.72	37.05
29-38 years	16.7		
39-48 years	55.6		
49-58 years	27.8		
Household size		5.00	1.41
1-3 persons	11.1		
4-6 persons	77.8		
above 6 persons	11.1		
Education level			
No formal education	5.5		
Primary Education	28.2		
Secondary Education	50.0		
Tertiary Education	16.3		
Income generating activities			
Civil Service	27.8		
Trading	50.0		
Artisan	16.7		
Agro-processing	5.6		
Farmer group			
Yes	72.2		
No	27.8		
Source of labour			
Family	61.1		
Hired	33.3		
Communal	5.6		
Farming experience		9.78	3.99
1-5 years	11.1		
6-10 years	44.4		
11-15 years	33.3		
> 15 years	10.9		
Monthly income		36,000	11,450
>20,000	5.6		
20,001-30,000	33.3		
30,001-40,000	33.3		
40,001-50,000	16.7		
< 50,000	11.1		

Source: Field Survey, 2016.

Knowledge of Grass Cutter Domestication

Table 2 reveals that the majority (94%) of the grass cutter farmers attested that there is no known religious discrimination against grass cutter production, 89% of them knew

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that grass cutter domestication can only be done in houses or cages, grass cutter domestication can be initiated with just 2 males and 6 females, grass cutters can give birth to up to ten young ones at once, Grass cutters infected with disease must be isolated to avoid disease spread, Grass cutters are omnivorous (feeds on both herbs and flesh) respectively. Results also shows that 83% of them knew that grass cutters can be reared with other domestic animals and that they do not need vaccination or treatment if kept in a hygienic environment. It was also revealed from the table that majority (78%) of respondents identified that grass cutters are neat animals and will not eat in dirty environment and that they stop reproduction after three years and 72% of them also knew that the gestation period for grass cutter is 5 months (154 days) while 67% of them knew that grass cutters can be kept for hide and skin production, that grass cutters are polygamy in nature and about 10 grass cutters can be kept in a room respectively. More than half of the respondents (56%) knew that grass cutters are herbivores and feed mostly on grasses. Generally, respondents' knowledge on grass domestication was high (61%) in the study area. These affirmative statements confirmed high knowledge of respondents on the domestication of grass cutter in the study area. Ogunjimi, Obaniyi and Adedeji (2012) opined that having proper information about an enterprise can lead to high knowledge about it. This implies that the respondents' knowledge about grasscutter domestication suggests an improvement in their level of agricultural production.

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Table 2: Knowledge of grass cutter domestication

Knowledge statements on grass cutter domestication	Yes
	%
Grass cutter domestication can only be done in houses or cages	88.9
Grass cutters are herbivores and feed mostly on grasses	55.6
Grass cutter domestication can be initiated with just 2 males and 6 females	88.9
Grass cutters can be reared with other domestic animals	83.3
Grass cutters can also be kept for hide and skin production	66.7
Grass cutters are polygamy in nature and about 10 grass cutters can be kept in a room	66.7
Grass cutter domestication help increase their productivity	50.0
Grass cutters do not need vaccination or treatment if kept in a hygienic environment	83.3
Grass cutter domestication requires a large expanse of farmland to practice	16.7
Grass cutter gestation period is 5 months (154 days)	72.2
Grass cutters can give birth to up to ten young ones at once	88.9
Grass cutters command high selling price than ruminant animals	27.8
Grass cutters are more nutritious than lean or poultry meat	77.8
Grass cutters must be vaccinated every 2 weeks to avoid disease outbreak	38.9
There is no known religious discrimination against grass cutter meat	94.4
Grass cutters infected with disease must be isolated to avoid disease spread	88.9
Grass cutters are omnivorous (feeds on both herbs and flesh)	88.9
Grass cutters are prolific like rabbits	66.7
Grass cutters are carnivorous	11.1
Grass cutters are neat animals and will not eat in dirty environment	77.8
Grass cutters stop reproduction after three years	77.8
Respondents with high knowledge level	61.1

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Attitude to Grass Cutter Production

Table 3 reveals that few (28%) of the farmers strongly agreed that domestication of grass cutter increases their productivity. Also, 50% of the respondents agreed that domesticated grass cutters are sweeter in taste than those in the forest, 33% agreed that grass cutters are more or less pets, that domesticating grass cutters increases their productivity and that domesticated grass cutters live longer than those not domesticated. Result further shows that a little above average (56%) disagreed that female grass cutters are more friendly than the males and that dark coloured grass cutters are wilder in nature than light coloured ones, 50% disagreed that domesticating grass cutters is wasting of time and resources while 44% disagreed that feeding of grass cutter is capital intensive. This suggests that many of the farmers basically practice the domestication for more income and not for other nutritional or economic benefits. Agbelusi, (2013) in a similar study also observed that favourable attitude of farmers towards the adoption of grasscutter farming is an indication of improved production which can be influenced by farmers' knowledge and their years of experience in grasscutter production.

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Table 3: Distribution of respondents' attitude to grass cutter domestication

Attitude statements	Mean
Feeding of grass cutters is capital intensive	4.06
Grass cutter domestication is mere wasting of time and resources	4.39
Grass cutter domestication contradicts my religious belief	4.39
Domestication of grass cutter increases their productivity	3.72
Domesticated grass cutters live longer than those in the forest	3.22
Grass cutter feeds can only be found in the forest	4.61
Grass cutters are not friendly animals	4.22
Domesticated grass cutters are sweeter in taste than those in the forest	3.61
Grass cutter domestication requires rigorous training	3.83
Only female grass cutters are easy to rear in cages	1.94
Grass cutters can never weigh more than 5kg no matter what they are fed with	3.50
Grass cutters prefer cages at room temperature	3.56
Grass cutters can be fed with household kitchen waste	2.28
Grass cutters are naturally shy	3.61
Female grass cutters are more friendly than the males	1.83
Dark coloured grass cutters are wilder in nature than light colored ones	3.83
Grass cutters find it difficult to survive in concrete pens than cages because of they need good ventilation	3.39
Grass cutters are more or less pets	3.06
Grasscutter meat have higher nutritional value than other domesticated animals	2.61
Feeding of grass cutters is capital intensive	4.06
Grass cutter domestication is mere wasting of time and resources	4.39
Grass cutter domestication contradicts my religious belief	4.39

Benefits Derived from Grass Cutter Production

Table 4 reveals that benefits derived from grasscutter production included cheap and cost effective enterprise ($\bar{x}$=1.56), increased income ($\bar{x}$=1.5), high resistance of animals to diseases ($\bar{x}$=1.39), Other benefits included high nutrient ($\bar{x}$ =1.33), highly prolific nature of animals ($\bar{x}$=1.28), eco friendliness ($\bar{x}$ = 1.22), stress-free enterprise ($\bar{x}$=0.89), non-seasonal enterprise ($\bar{x}$=0.67), High export value ($\bar{x}$=0.17). This implies that respondents' motivation for grasscutter domestication lies in the benefits derived from

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the agricultural enterprise. This assertion was confirmed by one of the respondents' response during the FGD conducted that:

"Grass cutter farming does not require much income to start the business and a farmer can be assured of realizing his capital in about six months if well managed"

Table 4: Benefits derived from grasscutter domestication

Benefits of grasscutter Domestication	Mean	Rank
	1.56	1st
Cheap and cost effective	1.50	2nd
Increased Income	1.39	3rd
High resistance to diseases	1.33	4th
High in nutrient	1.28	5th
Highly prolific nature of animals	1.22	6th
Eco friendly nature of animals	0.89	7th
Stress-free enterprise	0.67	8th
Non seasonal enterprise	0.17	9th
High export value	1.56	1st

Source: Field Survey 2016.

Factors Affecting Grass Cutter Domestication

Results on factors affecting production of grasscutters in the study area (Table 5) reveals that age (β= -0.767, p=0.033), and household size (β= -1.384, p=0.025) had significant but inverse relationship with grasscutter domestication while monthly income (β= 1.102, p=0.032), farming experience (β= 0.955, p=0.030) also had positive prediction on grasscutter production in the study area. It was further revealed on the same table that respondents' knowledge (β= 0.644, p=0.041) and benefits derived from the agricultural enterprise (β= 0.273, p=0.007) had significant influence on the domestication of grasscutters. This implies that the younger farmers are unlikely to be involved in grasscutter domestication than the older farmers and the adaptation of experience from other livestock management also assisted in the domestication of grass cutter. Large household size also had inverse significant influence on grasscutter production which implies that the higher the household size, the more difficult to be involved in grasscutter domestication as there will be responsibilities to be involved in within the family though there is probability of labour availability and assistance from

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other household members. Farming experience of respondents probably led to high knowledge on grasscutter production which eventually resulted in deriving more benefits from the agricultural enterprise. This result also agrees with Unaeze, (2016) that determinants of Grasscutter production included years of farming experience and benefits derived from the agricultural production.

Table 5: Distribution of factors affecting domestication of grass cutter

	β	SE	T
(Constant)		19.635	2.04
Age	-.767	.085	-2.42*
Religion	-.092	2.321	0.30
Education level	.456	.643	2.12
Household size	-1.384	.977	-3.50*
Monthly Income	1.102	.641	3.22*
Farm Size	.386	.937	0.98
Farming Experience	.955	.747	1.60*
Extension services	.007	1.009	0.02
Credit facilities	.677	1.178	1.91
Knowledge	.644	.537	2.23*
Attitude	.365	.225	1.40
Constraints	-.217	-.718	-1.64
Benefit	.273	.310	1.17*
$R = 0.634$ $R^2 = 0.573$ Adj. $R = 0.493$			

*P≤0.05

Conclusion and Recommendations

The study concluded that most utilised source of labour was family to reduce cost of labour. Respondents' farming experience informed their high knowledge about the agricultural enterprise resulting to deriving high benefits from it. The unfavourable attitude of the respondents was due to the fact that they were involved in the enterprise basically for economic benefits derived from the enterprise and were not probably satisfied with the amount of income realised from the enterprise. The fact that some of the farmers were also involved in some other agricultural enterprise and could not properly account for profit derived from grasscutter domestication alone could also be a

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justification for unfavourable attitude towards grasscutter domestication. Grass cutter domestication was therefore influenced by respondents' age, household size, income and years of farming experience. The study therefore recommends that farmers be given regular training by extension agents on the benefits of grass cutter domestication. Agricultural support services such as access to capital and land be made available to farmers through government efforts to encourage favourable attitude towards grasscutter domestication in the study area.

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