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BOOK OF PROCEEDINGS

3<sup>rd</sup>

International Conference/ Workshop  
on Giant African Land Snail

**SNAIL FARMING:  
IMPLICATIONS FOR INDUSTRIAL  
AND TECHNOLOGICAL GROWTH**

**1ST - 4TH JUNE, 2014**

**Centre for Degree Programme (CEDEP)  
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*EDITORS*

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Wed 4 <sup>th</sup> June 2014	10:00 – 12:00 noon	Tour & Departure
	3:00 – 5:00 pm	2 <sup>nd</sup> Scientific Session: Chairman - Dr A.I.A. Shotuyo
	5:00 – 8:00 pm	Break
	8:00 – 10:00 pm	2 <sup>nd</sup> Scientific Session: Chairman - Dr A.I.A. Shotuyo
	10:00 – 11:00 pm	3 <sup>rd</sup> Plenary Session: Chairman - Dr S.A. Fatoyinbo
	12:00 – 1:00 pm	Cocktail Party
	2:00 – 6:00 pm	Network meeting: Drs Jare Ebenezer & Kehinde Ajakaiye
	6:00 – 8:00 pm	PRODUCTION OF CALCIUM PHOSPHATE FROM SHELLS OF SNAIL SPECIES IN NIGERIA: MR. IDENYI AMUSA
	8:00 – 9:00 pm	Workshop Session: Chairman: Dr. Soyole
	9:00 – 10:00 pm	Observation: Dept of Animal & Aquaculture, OAU, Ile-Ife
	10:00 – 11:00 pm	2 <sup>nd</sup> Plenary Session: Chairman: Dr. M.A.O. Shotuyo
	11:00 – 12:00 pm	1 <sup>st</sup> Scientific Session: Chairman: Dr M.A.O. Shotuyo
	12:00 – 1:00 pm	AMBODE A.A. Dept of Home Science & Management, FUNAAB
	1:00 – 2:00 pm	SNAIL FARMING AND HOSPITALITY INDUSTRY
	2:00 – 3:00 pm	3 <sup>rd</sup> Plenary Session: Chairman - Dr S.A. Fatoyinbo
	3:00 – 4:00 pm	4 <sup>th</sup> Plenary Session: Chairman - Dr Ben Edegbunmi
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	7:00 – 8:00 pm	99 <sup>th</sup> Plenary Session: Chairman - Dr S.A. Fatoyinbo
	8:00 – 9:00 pm	100 <sup>th</sup> Plenary Session: Chairman - Dr Ben Edegbunmi

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## COMPARISON OF ECONOMIC FEASIBILITY AND SENSORY CHARACTERISTICS OF GIANT LAND SNAIL WITH SELECTED BUSHMEATS

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### ABSTRACT

This paper compares the economic feasibility and sensory characteristics of Giant land snail (*Archachatina marginata*) with common bush meats in Odeda Local Government Area of Ogun State of Nigeria. The bushmeat samples of three commonest wild animals in addition to the Giant land snail in the Odeda Local Government Areas were collected from the wild during the dry season. Economic and organoleptic evaluations were conducted using standard methods. Results showed that giant snail has the highest price per gram with ₦12.5, while rabbit, guinea fowl and grasscutter all have prices of ₦5/g. The prices per gram of protein of the meat samples analyzed are as follows; N20.20 for grasscutter, N21.40 for guinea fowl, N24.00 for bush rabbit and N61.0 for giant snail. Giant land snail meat was judged to be juicier than any of the other common bushmeat in the area, however it ranked lowest in attractiveness, tenderness and in overall acceptability

### INTRODUCTION

Bushmeat can also be literally defined as any wild animal that is hunted for human consumption but it is most commonly associated with the exploitation of animals within tropical forests (Bennett, 2002). In rural environment, bushmeat can be the only source of dietary protein to the people living in there, it also contribute significantly to the diet of people living in urban areas (Maisels *et al.*, 2001). However, in addition to the mentioned nutritional importance, snail have also been known to play other auxiliary roles especially in the area of trado- medicine where it is used as an antidote to many diseases and item for traditional rites (Ajayi *et al.*, 1978). Imevbrore and Andenmosun (1998) reported that low fat content and low cholesterol level make a snail a good antidote for vascular diseases such as hypertension and high blood pressure. According to Akinnusi (1997), snail meat is also used in the preparation of concoction for various ailments such as reduction of labour pains and blood loss by pregnancy women during delivery. Various snail and snail parts are also used in preparation of medicine to restore virility and fertility and cure small pox. It has also been noted that snail meat contain low levels of sodium (Na) and high level of potassium (K) hence, it is used in the treatment of Arteriosclerosis, Anemia and other fat related ailment.

Snail consumption is known to suppress attacks or crises of hypertension and diabetes which are very rampant among urban or city dweller or the affluent. Scrabblers and farmer now cash on this and sell snail at relatively high price to whoever might opt for snail eating regardless of circumstance. The inadequate supply of animal protein in developing countries has been attributed to high cost of conventional source of animal protein (poultry, goat, meet, beef, mutton and pork) hence, an average Nigeria consumes only about a quarter of his minimum daily animal protein requirement (Oke *et al.*, 2004). To meet this problem of shortage of conventional meats, alternatives have to be sourced for. This increase has bridged the supply and demand protein gap (Abulude, 2004). Many perceived bushmeat as a healthy food compared to industrial meats, so it could leads to more consumption of bush meats than industrial meats, while some others described it as delicacies. Animals hunted in the wild are frequently regarded as having medicinal properties or have particular symbolic or social importance (Mockrin *et al.*,

2005). Wild animals have consistently been used as a protein source throughout man's evolutionary history. Wild animals are efficient users of native vegetation and they can also adapt to man-modified habitats. They cause little, if any, environmental damage when harvested to control population densities in the absence of natural controls. Wild animal protein could be considered a part of the national meat supply but its potential has not been fully realized. As such, bushmeat plays an essential role in people's diets. This paper compares the economic feasibility and sensory characteristics of *Archachatina marginata* with common bush meats in Odeda Local Government Area of Ogun State of Nigeria.

**MATERIALS AND METHODS**

The bushmeat samples of three commonest animals in addition to the Giant land snail (Table 1) in the Odeda Local Government Areas were collected from the wild during the dry season of 2013. The Grasscutter (*Thryonomys swinderianus*), Guinea fowl (*Numida meleagris*), and Hare (*Lepus sp*) were scarified, defeathered and deskined, weighed, dissected to separate the parts and weighed along with the de-shelled and thoroughly washed giant snail in the Department of Forestry and Wildlife Laboratory of the Federal University of Agriculture, Abeokuta, Nigeria. The meat were oven dried at 105°C between 6-10 hours depending on the samples, ground in Kenwood blender, sieved (45mm) and stored prior to analyses as used by Abulude (2007). Samples were analyzed for proximate composition using AOAC (1990) procedure. Carbohydrate was determined by difference. Minerals were analyzed using the Pearson (1981) methods. Digestibility, Biological Value (BV), Net Protein Utilization (NPU) and NPV were determined using the methods of Adeola (1995). Organoleptic evaluation was carried out by a panel of 10 judges to evaluate the attractiveness, tenderness, flavour, juiciness and overall acceptability (otherwise regarded as taste) on a 7-point scale. Economic feasibility was calculated for 100g protein (NACA, 1989):

$$\text{Rate of 100g (Protein) in Naira (\#)} = \frac{\text{Price of 1kg of meat sample}}{\text{Amount of Protein 1kg of meat sample}} \times 100$$

All determinations were in triplicate. Statistical evaluations were done using analysis of variance for sensory evaluation of the various meat samples at 5% probability level.

**Table 1: Names of the Bush meat Sample used for the Analysis**

English name	Local name	Scientific name
Grasscutter	Oya	<i>Thryonomys swinderianus</i>
Guinea fowl	Awo	<i>Numida meleagris</i>
Hare	Ehoro Igbo	<i>Lepus sp</i>
Snail	Igbin	<i>Archachatina marginata</i>

**RESULTS AND DISCUSSION**

**Comparison of Economic Feasibility:**

Results showed (Table 2) that giant snail has the highest price per gram with ₦12.5, while rabbit, guinea fowl and grasscutter all have prices of ₦5/g. Protein content of grasscutter, guinea fowl, snail and hare were 24.7g/ml, 23.4g/ml, 20.5g/ml, and 20.8g/ml respectively. The prices per gram of protein of the meat samples analyzed are as follows; N20.20 for grasscutter, N21.40 for guinea fowl, N24.00 for bush rabbit and N61.0 for giant snail. Hence, giant snail also has the highest price per gram of protein of meat sample. This shows that snail meat is not a cheap source of animal protein, rather people eat snail meat for other nutritional or medicinal purposes derived from it as emphasized by previous research works including Oduntan *et al.* (2012).

**Table 2: Economic Feasibility of Meat Samples Analyzed**

Meat sample	Price of 1g of meat (N)	Protein content/g	Price of 1g of protein
Snail	12.5	20.5	61.0
Guinea fowl	5	23.4	21.4
Grasscutter	5	24.7	20.2
Hare	5	20.8	24.0

**Comparison of Sensory Characteristics:**

It could be seen from Table 3 below that the attractiveness to the meat samples differs mainly with guinea fowl and rabbit with the highest value 4.67. Giant snail however has the lowest value (3.33) for attractiveness. Although, giant snail is known to be very attractive when cooked in stew and/or vegetable with various additives that makes it inviting; however, since the meat samples were only oven-dried and afterward ground in a blender, it lacks the properties of its usual look in stew.

**Table 3: The Sensory Values of the Various Cooked Meat Samples**

Factors	Grasscutter	Guinea fowl	Hare	Snail	SEM	P
Attractiveness	3.83 <sup>ab</sup>	4.67 <sup>a</sup>	4.67 <sup>a</sup>	3.33 <sup>b</sup>	0.173	0.017
Juiciness	3.50 <sup>a</sup>	4.00 <sup>a</sup>	3.83 <sup>a</sup>	4.00 <sup>a</sup>	0.124	0.684
Flavour	3.33 <sup>a</sup>	4.00 <sup>a</sup>	3.83 <sup>a</sup>	3.64 <sup>a</sup>	0.130	0.536
Tenderness	4.00 <sup>a</sup>	3.83 <sup>a</sup>	3.83 <sup>a</sup>	3.67 <sup>a</sup>	0.118	0.949
Acceptability	3.67 <sup>a</sup>	4.00 <sup>a</sup>	4.00 <sup>a</sup>	3.50 <sup>a</sup>	0.128	0.633

<sup>ab</sup> Means within rows without common superscript differ at  $p < 0.05$

Means bearing identical letters in a column are not significantly different from each other by Duncan's Multiple Range Test (DMRT) at 5%. (Appendix 1)

On the contrary, giant snail has the highest mean value (4.00) for juiciness alongside guinea fowl. This may as well account for why the snail meat is comparatively highly priced as observed in Table 2; hence the meat is regarded as delicacy for many (Abulude, 2007; Akinyemi and Oduntan, 2004).

However, in term of flavour the mean value of guinea fowl (4.00) and hare (3.83) were higher than the land giant snail (3.67).

In addition, giant snail expectedly had the lowest mean value (3.67) for tenderness when compared with other meat samples. This can be traced to the tough nature of the animal foot. Grasscutter (4.00) has the greatest tenderness across the meat samples with guinea fowl and hare following at 3.83.

Also, giant snail had the lowest mean value of 3.5 for overall acceptability when compared with guinea fowl (4.00), hare (4.00) and grasscutter (3.67) based on the panel's taste judgement. This further emphasis that eating giant snail is beyond its taste value.

**CONCLUSION AND RECOMMENDATION**

Giant land snail has the highest price per gram of protein when compared with other common bushmeat in Odeda Local Government Areas of Ogun State. Hence, Snail meat is not a cheap source of protein in the local Government Area. In addition, although giant snail meat was judged to be juicier than any of the other common bushmeat in the area, however it ranked lowest in attractiveness, tenderness and in overall acceptability, otherwise regarded as taste. There is need to encourage massive domestication of giant snail in the Local Government Area, so as to increase its availability/ supply; in order to help bring about reduction in its price.

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