



## BUSHMEAT MARKETING IN SOME SELECTED MARKETS IN BENIN CITY, NIGERIA

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### ABSTRACT

A study on bushmeat occurrence, weight and prices were carried out in eight selected markets in three local government areas in Benin City, Nigeria. Live, dead and processed (smoked) bushmeat brought to the markets were weighted using electronic weighing machine. Twelve wildlife species were recorded as sources of bushmeat, they included *Sylvicapra grimmia*, *Thryonomys swinderianus*, *Manis gigantea*, *Potamochoerus porcus* and *Cercopithecus mona* among others. The mean weekly bushmeat weight was 5,993kg, and 28% 28.79% and 14.39% of the weights were recorded in Ekiuwa and Ekiosa markets, respectively. A total live weight of 560kg and 216kg of *Crocodylus niloticus* and *Varanus albigularis*, respectively, were recorded. Also, 23,972kg and 287,644kg of bushmeat were recorded in the eight selected markets per month and per year respectively. There was significant difference ( $P < 0.05$ ) between the weight of bushmeat supplied to the selected markets.

**Key word:** Wildlife species; Bushmeat occurrence and weight

### INTRODUCTION

Bushmeat is the meat of wild animals hunted by local people for income or subsistence in West and Central Africa, and is consumed fresh, smoked, salted or sundried. Smoked bushmeat is the most consumed available product in the rural, sub-urban and urban markets in most African countries (Ntiama-Baidu, 1997). Wildlife resources represent a renewable natural resource of great importance for most forest and savanna dwelling human communities as well as for those living in many other rural communities. Hunting is the practice of capturing game animals (usually wildlife) lawfully for food, recreation, or trade. In present-day use, the term refers to lawful hunting, as distinguished from poaching, which is the illegal killing, trapping or capture of the game species for different end uses. Bushmeat provides higher than average annual income to hunters and many traders (Defoliart, 1995). Wild animals contributed 29% or more of the animal's protein in rural diets in at least 62 countries. In West Africa, there is a high level of bushmeat consumption, it accounted for 75% of meat intake in Liberia (Bennett and Robinson, 2000).

Bushmeat trade is the main source of livelihood to rural communities (Kalu and Aiyeloja, 2001). In Ghana and Cote d'ivoire 305,000 and 100,000 tonnes of bushmeat were sold annually in 1998 and 1996 at the values of US\$275 and US\$90 million

respectively. In Nigeria, estimate of the values of bushmeat has been put at N20 million, N300 million and N2.1 billion in 1970, 1988 and 2000 respectively (Anadu *et al.*, 1988; Martin, 2000). Bushmeat demand is growing in Africa in response to increased human population and poverty. For instance, 80% of rural Kenyan households depend on bushmeat for their protein intake (Bennett, 2000). However, hunting risks the extinction of species unique to tropical forests (Bodmer *et al.*, 1997).

The unsustainable game hunting and trade in bushmeat is a major human induced threat to fauna biodiversity where the loss of fauna is reaching critical level (Nasi *et al.*, 2008). There is therefore, the need to ascertain the quantity of bushmeat supply to community markets for consumption. The objectives of the study were to identify the wildlife species used as bushmeat, their availability and prices of the bushmeat products in some selected markets in Benin City in Nigeria.

## MATERIALS AND METHODS

### Study Area

Benin City is located in Edo State, Nigeria. The State has a land area of about 19,707km<sup>2</sup> (Beaks and Geomatics, 1999). It is located between longitudes 5<sup>o</sup> 34' and 5<sup>o</sup> 39' E and latitudes 6<sup>o</sup> 2' and 6<sup>o</sup> 7'N, and has a tropical climate with humid condition. Benin City is made of 3 local government areas, namely Oredo, Egor and Ikpoba-Okha. The annual rainfall is between 1,500 and 2,000mm. The temperature is within the range of 27<sup>o</sup> and 32<sup>o</sup>C, while humidity ranges between 75 and 95%. The vegetation is lowland rainforest with common forest wildlife species. The soil is plain sand and lignite group with high acidity and the relief is gentle slope with an average high 60m and slope between 5<sup>o</sup> with highest elevation of 75m above sea level (Beaks and Geomatics, 1999).

### Survey Techniques

A reconnaissance survey was made to identify markets where bushmeat were traded in the 3 local government areas that made up Benin City. Eleven markets were identified of which eight were randomly selected for this study, representing 72.7% sampling intensity. The selected markets were New-Benin, Ekiosa and Ekiuwa markets in Oredo Local Government Area; Oliha and Uselu markets in Egor Local Government Area; Oregbeni, Arbico and Santana markets in Ikpoba-Okha Local Government Area.

Bushmeat of wildlife species brought to the markets were identified using wild animals' taxonomic keys as described by Walsh and White (1999). The bushmeat supplied to the markets were classified into three categories; live, dead/unprocessed and processed/smoked. The bushmeat products in the markets were weighted using electronic weighing machine (Mettmler pm 4800) model, and the prices and sources of the bushmeat were determined from personal communication with the traders and the hunters. Frequency of occurrence of bushmeat of the wildlife species was determined as follows:

$$F_k = \sum Y_i / n \times 100$$

Where:  $F_k$  = frequency,  $Y_i$  = incidence of species k in site i, n = number of species. All data collected were subjected to Analysis of Variance (ANOVA) at  $P > 0.05$  as described by Alika (2006). The study was conducted for 12 months from January to December, 2009.

## RESULTS AND DISCUSSION

### Bushmeat Occurrence

Twelve wildlife species served as sources of bushmeat in the eight markets with total frequency of occurrence of 521 (Table, 1). Out of the mean weekly frequency of 521 recorded, Ekiuwa, Ekiosa, Abrico, New-Benin and Oliha markets had 150, 75, 64, 63 and 50 respectively, representing 28.79, 14.39, 12.28, 12.09 and 9.59%, respectively (Table, 1). The least frequency of wildlife species was recorded in Santana market (27) followed by Uselu market (35). *Sylvicapra grimmia* was the most common wildlife species used as bushmeat (157), followed by *Thryonomys swinderianus*, *Manis gigantea* and *Potamochoerus porcus* with frequency of 84, 58 and 43 respectively. *Cercopithecus mona* and *Lycaon pictus* had the lowest frequencies of 10 and 6 respectively (Table, 1). The quantities of bushmeat supplied to the selected 8 markets were significantly different at ( $P < 0.05$ ).

### Mean Weekly Bushmeat Weight and Prices

A total mean weekly bushmeat weight of 5,993kg was recorded in all the selected markets, out of which 811.72, 1,644 and 3,537.28 kg were live, dead/unprocessed and smoked products respectively, representing 13.54, 27.43 and 59.03% in the same order (Table, 2). The largest mean weekly live weights of 216, 520 and 54kg were recorded for *Varanus albigularis*, *Crocodylus niloticus* and *Geochelone sulcata* respectively. A mean weekly weight of processed (smoked) bushmeat for *Sylvicapra grimmia*, *Potamochoerus porcus* and *Tragelaphus scriptus* recorded in the markets were 2,355, 1,290 and 540 kg, respectively. Prices of live bushmeat in the selected markets ranged between 560 and 1,650 naira/kg. Bushmeat of *Lycaon pictus* was the most priced while that of *Cercopithecus mona* was the least priced.

The high frequency of bushmeat recorded in Ekiuwa market (150), representing 28.79% of the total bushmeat biomass supplied to the selected markets, may not be unconnected with the proximity of the market to the existing wildlife conservation areas such as National Park and forest reserves such as Okomu National Park, Ogba, Gelle-gelle and Ologbo forest reserves, as all the bushmeat supplied to the markets were from the wild. Also, Ekiuwa market serves as bushmeat aggregate centre. This is in consonance with the view of Hart (2000) that markets located around conservation areas usually have high bushmeat supply.

It was also found that the main form of bushmeat recorded in the markets was smoked. Godoy, (2000) earlier noted that consumers of bushmeat preferred smoked bushmeat than any other form of preservation due to improved flavour and aroma. There were significant differences ( $P < 0.05$ ) between the weight of live, dead/unprocessed and processed/smoked wildlife products recorded in the selected markets.

Table 1: Mean weekly frequency of bushmeat in selected markets in Benin City

| Wildlife species<br>used as bushmeat | Local<br>name<br>(Bini) | Markets         |                 |                 |                  |                 |
|--------------------------------------|-------------------------|-----------------|-----------------|-----------------|------------------|-----------------|
|                                      |                         | Oregbeni<br>(1) | Ekiosa<br>(2)   | Arbrico<br>(3)  | New<br>Benin (4) | Oliha<br>(5)    |
| <i>Sylvicapra grimmia</i>            | Uzo                     | 20              | 24              | 29              | 13               | 12              |
| <i>Thronomys swinderianus</i>        | Evuato                  | 5               | 18              | 10              | 11               | 8               |
| <i>Atheaurus africanus</i>           | Okhaen                  | 5               | 4               | 3               | 8                | 3               |
| <i>Potamocheirus porcus</i>          | Esiha                   | 3               | 6               | 5               | 5                | 1               |
| <i>Tragelaphus scriptus</i>          | Erue                    | 1               | 5               | 1               | 1                | 1               |
| <i>Cercopithecus mona</i>            | Eme                     | nil             | 1               | 1               | 1                | 2               |
| <i>Cricetomys gambianus</i>          | Ofionto                 | 4               | 4               | 3               | 3                | 5               |
| <i>Manis gigantea</i>                | Ekhui                   | 8               | 8               | 6               | 10               | 6               |
| <i>Varanus albigularis</i>           | Ewuwu                   | 4               | 2               | 3               | 5                | 4               |
| <i>Crocodylus niloticus</i>          | Agbaka                  | 2               | 1               | 2               | 4                | 4               |
| <i>Geochelone sulcata</i>            | Egue                    | 4               | 1               | 1               | 1                | 3               |
| <i>Lycaon pictus</i>                 | Akuaha                  | 1               | 1               | nil             | 1                | 1               |
| Total                                |                         | 57 <sup>b</sup> | 75 <sup>c</sup> | 64 <sup>b</sup> | 63 <sup>b</sup>  | 50 <sup>b</sup> |
| Proportion (%)                       |                         | 10.94           | 14.39           | 12.28           | 12.09            | 9.59            |

  

|                               |         | Markets          |                 |                 |       |                   |
|-------------------------------|---------|------------------|-----------------|-----------------|-------|-------------------|
|                               |         | Ekiuwa<br>(6)    | Santana<br>(7)  | Uselu<br>(8)    | Total | Proportion<br>(%) |
| <i>Sylvicapra grimmia</i>     | Uzo     | 35               | 10              | 14              | 157   | 30.13             |
| <i>Thronomys swinderianus</i> | Evuato  | 21               | 5               | 6               | 84    | 16.12             |
| <i>Atheaurus africanus</i>    | Okhaen  | 14               | 2               | 1               | 40    | 7.67              |
| <i>Potamocheirus porcus</i>   | Esiha   | 21               | 1               | 1               | 43    | 8.25              |
| <i>Tragelaphus scriptus</i>   | Erue    | 12               | 2               | 4               | 27    | 5.18              |
| <i>Cercopithecus mona</i>     | Eme     | 4                | nil             | 1               | 10    | 1.92              |
| <i>Cricetomys gambianus</i>   | Ofionto | 5                | 1               | nil             | 25    | 4.80              |
| <i>Manis gigantea</i>         | Ekhui   | 12               | 4               | 4               | 58    | 11.13             |
| <i>Varanus albigularis</i>    | Ewuwu   | 8                | 1               | nil             | 27    | 5.13              |
| <i>Crocodylus niloticus</i>   | Agbaka  | 10               | 1               | 2               | 26    | 4.99              |
| <i>Geochelone sulcata</i>     | Egue    | 6                | nil             | 2               | 18    | 3.45              |
| <i>Lycaon pictus</i>          | Akuaha  | 2                | nil             | nil             | 6     | 1.15              |
| Total                         |         | 150 <sup>d</sup> | 27 <sup>a</sup> | 35 <sup>a</sup> | 521   | 100               |
| Proportion (%)                |         | 28.79            | 5.18            | 6.72            |       |                   |

Values with the same letter in row are not significantly different ( $P > 0.05$ )

## Bushmeat marketing in Benin City

Table 2: Mean weekly bushmeat weight and prices in selected markets in Benin City.

| Wildlife species used as bushmeat | Local name (Bini) | Live weight (kg)    | Dead/unprocessed weight (kg) | Smoked weight (kg)    | Total weight (kg) |
|-----------------------------------|-------------------|---------------------|------------------------------|-----------------------|-------------------|
| <i>Sylvicapra grimmia</i>         | Uzo               | Nil                 | 942                          | 1413                  | 2,355             |
| <i>Thronomys swinderianus</i>     | Evuato            | 6.72                | 151.2                        | 178.08                | 336               |
| <i>Atheaurus africanus</i>        | Okhaen            | Nil                 | 51.2                         | 108.8                 | 160               |
| <i>Potamocherus porcus</i>        | Esiha             | nil                 | 258                          | 1032                  | 1290              |
| <i>Tragelaphus scriptus</i>       | Erue              | nil                 | 162                          | 378                   | 540               |
| <i>Cercopithecus mona</i>         | Eme               | nil                 | Nil                          | 150                   | 150               |
| <i>Cricetomys gambianus</i>       | Ofionto           | 15                  | 10                           | 25                    | 50                |
| <i>Manis gigantea</i>             | Ekhui             | nil                 | 69.6                         | 162.4                 | 232               |
| <i>Varanus albigularis</i>        | Ewuwu             | 216                 | Nil                          | Nil                   | 216               |
| <i>Crocodylus niloticus</i>       | Agbaka            | 520                 | Nil                          | Nil                   | 520               |
| <i>Geochelone sulcata</i>         | Egue              | 54                  | Nil                          | Nil                   | 54                |
| <i>Lycaon pictus</i>              | Akuaha            | nil                 | Nil                          | 90                    | 90                |
| Total                             |                   | 811.72 <sup>a</sup> | 1,644 <sup>b</sup>           | 3,537.28 <sup>c</sup> | 5,993             |
| Proportion (%)                    |                   | 13.54               | 27.43                        | 59.03                 |                   |

  

|                               |         | Proportion (%) | Mean Weight (kg) | Price N/kg |
|-------------------------------|---------|----------------|------------------|------------|
| <i>Sylvicapra grimmia</i>     | Uzo     | 39.30          | 15               | 1,300      |
| <i>Thronomys swinderianus</i> | Evuato  | 6.11           | 4                | 1,500      |
| <i>Atheaurus africanus</i>    | Okhaen  | 2.67           | 4                | 710        |
| <i>Potamocherus porcus</i>    | Esiha   | 21.52          | 30               | 950        |
| <i>Tragelaphus scriptus</i>   | Erue    | 9.01           | 20               | 1,100      |
| <i>Cercopithecus mona</i>     | Eme     | 2.50           | 15               | 560        |
| <i>Cricetomys gambianus</i>   | Ofionto | 0.83           | 2                | 900        |
| <i>Manis gigantea</i>         | Ekhui   | 3.87           | 4                | 860        |
| <i>Varanus albigularis</i>    | Ewuwu   | 3.60           | 8                | 895        |
| <i>Crocodylus niloticus</i>   | Agbaka  | 8.68           | 20               | 1,800      |
| <i>Geochelone sulcata</i>     | Egue    | 0.90           | 3                | 940        |
| <i>Lycaon pictus</i>          | Akuaha  | 1.50           | 15               | 1,650      |
| Total                         |         | 100            |                  |            |
| Proportion (%)                |         |                |                  |            |

Values with the same letter in row are not significantly different ( $P > 0.05$ )

## CONCLUSION

It could be generally concluded that the study had shown that, a total of 5,993 kg/week of bushmeat was recorded in the 8 selected markets, which means that a total of 23,972kg and 287,664kg of bushmeat were supplied to the selected markets per month and per year respectively. This will definitely have high detrimental effect on the existing wildlife populations and their habitats in the conservation areas which serve as sources of the bushmeat, as all the bush meat supplied to all the markets were from the wild, as confirmed by both the traders and the hunters. This may continue to endanger the wildlife species conservation status into, as the rate of poaching is increasing.

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