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Effect of Ebola Virus on Bush Meat Sales in Benin City, Edo State, Nigeria

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ABSTRACT: The Ebola virus and its link to bush meat species in Nigeria was received differently by people. While some believed and took precautions others did not and continued the consumption of bush meat. Consequently, a survey of ten markets in Benin City was undertaken between December 2014 and April 2015 to compare bush meat patronage during the pre- and post-Ebola period. Markets visited included, Oba Market, New Benin Market, Oliha market, Uwa market, Santana market, Evbuotubu market, Oregbeni market, Uselu market, Ekiosa market and Ugbighokho market. Questionnaires were administered to 95 traders by random sampling. Results showed that 43.2% had been in the trade for over 10 years. Only 63.5% believed in the reality of the virus. Precautions were taken by 65.6% of the respondents. There was no significant association between knowledge of Ebola Virus and precautions taken ($P>0.05$). Some traders in bush meat interviewed lamented the low sales they recorded daily as compared to the pre-Ebola period. Others (53.7%) said sales were still the same while 22.1% believed it was higher. Prices of the various bush meat species dropped during the Ebola Virus scare and returned to normal or a little below the initial price immediately after. Continuous education should be given to Nigerians on the reality of the Virus to forestall any accidental re-occurrence.

Keywords: Ebola virus, Bush meat sales, Precautions, Re-occurrence

Introduction

Over the years, bush meat - meat gotten from wild life has been the main protein source of local people in rural communities. However in the urban areas, it is one of the delicacies affordable only by the average and elites because of its cost. The emergence of the Ebola Virus and its association with wildlife was received by some people with scepticism who continued its consumption while others left off the eating of bush meat for a time when the Ebola scare would have died down (Plee, 2015).

Reduction in the purchase and consumption of bush meat species during the Ebola virus period in Calabar was reported by Nkonyu and Dunn (2014) and Ndem *et al.* (2015). Akani *et al.* (2015) also reported a drastic reduction in the sale of bush meat in several states in south western Nigeria during the Ebola crisis. In Liberia where the crisis was very severe, Ordaz-Nemeth *et al.* (2017) recorded a reduction in bush meat consumption across different income groups although the reduction was much less in high income earners.

Surprisingly, despite the fatal nature of the disease and its connection with bush meat, some consumers, hunters and traders saw it as conspiracy by government to discourage bush meat trade and hunting. Some traders however devised means of prevention of contacting the Ebola virus by washing of hands and the use of masks (Aiyegbusi *et al.* 2016). Although bush meat especially fruit bats and primates were strongly implicated, Egbedade *et al.* (2015) cautions against indiscriminate culling of indicator species as this could have serious conservation implications.

To the best knowledge, there is no documented study relating the Ebola virus and bush meat consumption in Benin City. This work was therefore carried out to determine the effects of the virus scare on bush meat sales in Benin City, Nigeria.

Materials and methods

Ten markets (Oba Market, New Benin Market, Oliha market, Uwa market, Santana market, Evbuotubu market, Oregbeni market, Uselu market, Ekiosa market and Ugbighokho market) in Benin City (6° 20' 21.0660" N, 5° 37' 2.8092" E), Edo State, Nigeria were visited weekly between December 2014 and April 2015 to compare bush meat patronage before, during and after the Ebola virus outbreak. The markets were chosen based on their popularity with bush meat sales.

Questionnaires were administered to 95 traders in bush meat by random sampling requesting information on their knowledge and belief in the reality of the Ebola virus; prices before, during and after the virus scare; and precautions taken (if any) during this period. The number of respondents who volunteered information from each market is shown in Table 1.

Results were subjected to the Chi-Square analysis using SPSS 14 statistical package.

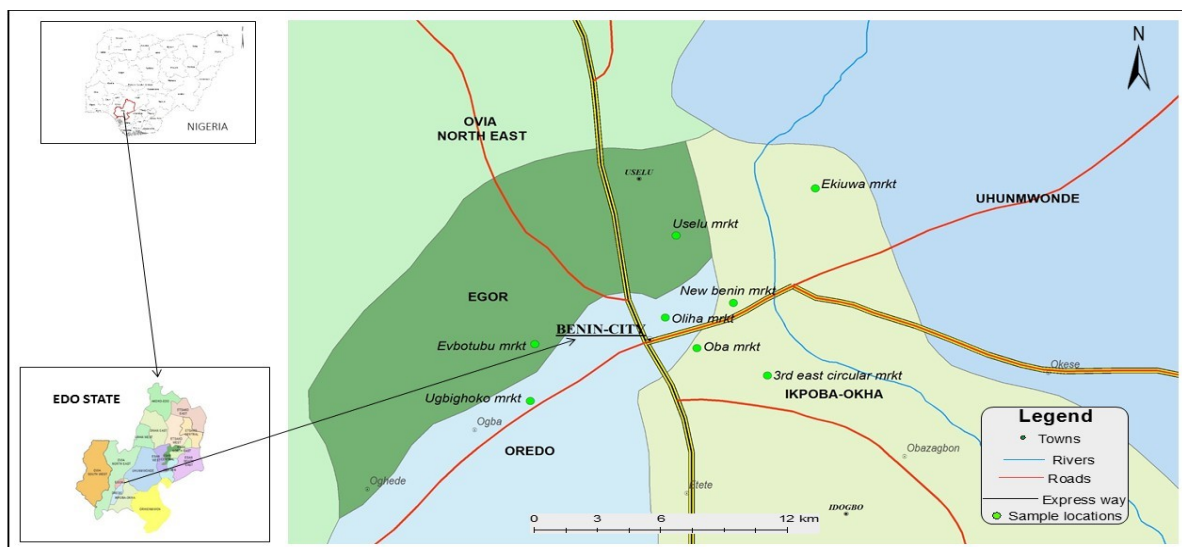


Fig. 1: Map showing the various markets sampled in Benin City

Results

The bushmeat trade was dominated by females (91.6%); with only 8.4% being males. Most of the respondents were literate: 69.5% had primary education, 29.5% had secondary education while one of the respondents had tertiary education (Table 1).

The variety of bushmeat sold in the various markets and number of respondents involved in it is shown in (Table 2). Of the 95 traders interviewed, 43.2% had been in the trade for over 10 years while 8.4% had been in the business for over 16 years. Although all the traders had heard about the virus either from the news media or family and friends only 63.5% believed it was real while the other 36.5% of the respondents did not believe. 53.7% of the traders were of the opinion that bush meat patronage was generally unaffected by the Ebola virus scare while 22.1% even believed that patronage was even higher. Of the number that believed the reality of the virus, only 65.6% took any precaution whatsoever. Although the prices of the various bush meat species dropped during the Ebola virus scare, the prices of most species bounced back to normal in the sale of bush pig, bush monkey, porcupine, squirrel, boa constrictor and tortoise or just a little below the initial price as in the crocodile, rabbit and antelope (Table 3). Statistical analysis showed no significant association between the knowledge of Ebola virus and precautions taken $P > 0.05$

Table 1: Socio-economic characteristics of respondents (n=95)

Variables	Markets										Total (n = 95)
	Oba (n = 10)	New Benin (n = 10)	Ekiosa (n = 7)	Evbuotubu (n = 10)	Oliha (n = 10)	Oregbeni (n = 9)	Santana (n = 10)	Ugbighioko (n = 10)	Uselu (n = 10)	Uwa (n = 9)	
Age (years)											
• 20 – 30	0	1	0	6	1	0	0	0	0	0	8 (8.4)
• 31 – 40	3	2	0	3	1	2	1	1	4	2	19 (20.0)
• 41 – 50	6	6	7	1	5	7	9	9	2	7	59 (62.1)
• > 50	1	1	0	0	3	0	0	0	4	0	9 (9.5)
Sex											
• Male	0	0	0	1	4	2	0	0	0	1	8 (8.4)
• Female	10	10	7	9	6	7	10	10	10	8	87 (91.6)
Educational Qualification:											
• Primary	10	8	6	1	9	4	8	5	9	6	66 (69.5)
• Secondary	0	2	1	8	1	5	2	5	1	3	28 (29.5)
• Tertiary	0	0	0	1	0	0	0	0	0	0	1 (1.0)
Years of Experience (years)											
• 1 – 5	1	0	0	2	4	4	0	0	1	0	12 (12.6)
• 6 – 10	4	3	2	7	3	2	3	3	3	4	34 (35.8)
• 11 – 15	4	5	4	1	3	3	7	7	3	4	41 (43.2)
• > 16	1	2	1	0	0	0	0	0	3	1	8 (8.4)
Occupation											
• Civil servant	0	0	0	0	0	1	0	0	0	0	1 (1.1)
• Business	0	1	0	0	0	2	0	0	0	0	3 (3.2)
• Petty Trader	10	9	7	9	10	6	10	10	10	9	90 (94.7)
• Farmer	0	0	0	1	0	0	0	0	0	0	1 (1.1)

Table 2: Type of Bush meat and number of respondents involved in sales in all the markets

S/N	Type of Bush Meat Sold	Number of Respondents Involved in Sales
1.	Antelope	70
2.	Grasscutter	55
3.	Bushdog	40
4.	Bush pig	46
5.	Squirrel	25
6.	Anteater	25
7.	Rabbit	13
8.	Porcupine	19
9.	Bush Monkey	8
10.	Boa Constrictor	3
11.	Tortoise	8
12.	Crocodile	8
13.	Alligator	2

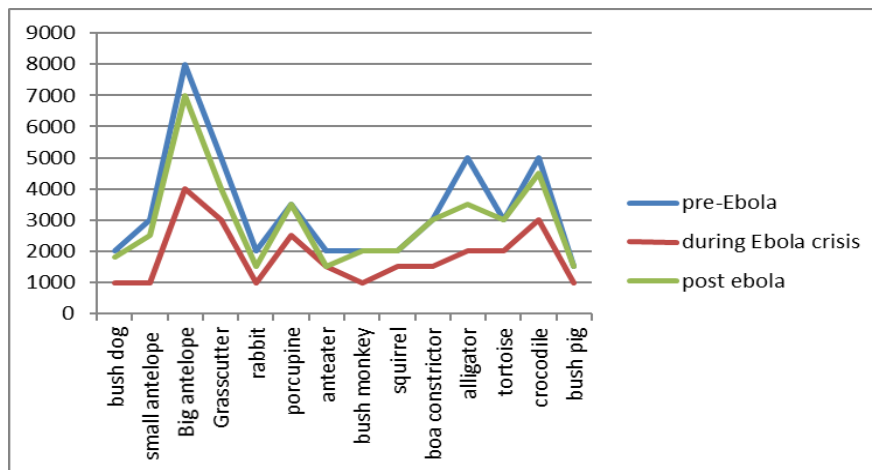


Fig. 2: Bush meat sales before, during and after the Ebola virus scare

Table 3: Variety of bush meat and prices before, during and after the Ebola crisis

Bush meat	Pre-Ebola period	Ebola period	Post-Ebola period
Bush dog	₦2000 - ₦2500	₦1000 - ₦1500	₦1800 - ₦2000
Bush pig	₦1500 - ₦1800	₦1000 - ₦1200	₦1500 - ₦1800
Antelope (small)	₦3000 - ₦3700	₦1000 - ₦1600	₦2500 - ₦2900
Antelope (big)	₦8000 - ₦9500	₦4000 - ₦4600	₦7000 - ₦8000
Grass cutter	₦5000 - ₦5400	₦3000 - ₦3300	₦4000 - ₦4700
Rabbit	₦2000 - ₦2200	₦1000 - ₦1500	₦1500 - ₦1900
Squirrel	₦2000 - ₦2400	₦1500 - ₦1800	₦2000 - ₦2500
Anteater	₦2000 - ₦2400	₦1500 - ₦1700	₦1500 - ₦1800
Porcupine	₦3500 - ₦3800	₦2500 - ₦2700	₦3500 - ₦3800
Bush monkey	₦2000 - ₦2300	₦1000 - ₦1500	₦2000 - ₦2200
Crocodile	₦6000 - ₦6500	₦4000 - ₦4800	₦5500 - ₦5800
Alligator	₦6000 - ₦6500	₦3000 - ₦3800	₦4500 - ₦5000
Boa Constrictor	₦3000 - ₦3500	₦2000 - ₦2800	₦3000 - ₦3600
Tortoise	₦3000 - ₦3200	₦2000 - ₦2400	₦3000 - ₦3300

(Prices in Naira are for whole animals depending on size)

Discussion.

The literacy level of the sampled bushmeat traders could be said to be above average as over 69.5% had primary education while 29.5% had secondary education; one of them is even a graduate from one of a tertiary institution! With the widespread dissemination of information concerning Ebola and its link to wildlife popularly known as bushmeat from radio, newspaper and TV, it would not be wrong to say that the bush meat traders have a proper understanding of the Ebola issue. Oyediran *et al.* (2015) reported that awareness of the Ebola virus was gotten by respondents from various sources which included family members, friends, customers, news media and fellow bush meat traders. Generally, the awareness level could be said to be high. The length of time they had also been in business could also be a factor responsible for their continuing with the bush meat trade despite the high risk during the period; as most of them had been in the business for over 10years. Moreover, about 94.7% were petty traders whose sole business was bushmeat trade and may not readily have an alternative. Plee (2015) reported a similar situation in Ghana in which a bush meat trader said she couldn't stop the trade as it was her only source of income. Oyediran *et al.* (2015), in his study in a part of Oyo State, however recorded some coping strategies during the crisis amongst bushmeat traders and food vendors to include selling of ice fish, catfish, beef and goat meat.

Among the bushmeat traders, those involved with the selling of antelopes was highest with 70 persons. This was followed by the grasscutter traders with 55 persons; bush pig and bush dog 46 and 40 persons respectively. Akani *et al.* (2015) had also recorded antelopes and monkeys as being top on the list of threatened animals used for bush meat.

Although some precautionary measures were taken by some of the respondents which included washing of hands after handling of the bushmeat and wearing of face masks, statistical analysis showed no significant ($P>0.05$) association between the knowledge of Ebola virus and precautions taken. Low levels of precaution could easily transfer the virus from person to person in the event of its occurrence in the country. In Guinea, one of the countries seriously hit by the Ebola virus, although there was confusion and doubt as to the relationship between the Ebola virus and wild life, animals like bats and primates found dead were not consumed (Plee, 2015).

The fact that over 50 of the respondents said that bush meat patronage generally was same as before the outbreak while some even said patronage was higher was rather surprising. Individual preference for bushmeat could be due to particular taste of a species or its affordability. The view that patronage could be higher may be an indication that most people did not believe in the existence of Ebola or its relationship with bush meat. This results agrees with the study of Plee (2015) which predicted that as soon as the epidemic was declared over, traders would go back to their business as usual. Although Akani *et al.* (2015) had speculated that the outbreak of the Ebola virus disease and its association with bush meat would mean a positive sign for conservation, results have shown that this was only as long as the disease lasted as business returned to almost normal immediately.

The reduction of the prices of the various bushmeat observed during the Ebola crisis encouraged people to buy and sell off the meat faster (Aiyegbusi *et al.*, 2016).

The high percentage of the populace that did not believe in the reality of the virus is a pointer that government and other non-governmental organisations still has a lot to do in terms of educating the people. The news and print media should continue in awareness programmes. Coping strategies should also be devised by people involved directly in bush meat trade in the event of a re-occurrence. The increased awareness campaign in hand washing at schools, homes, offices and other public places should be sustained even if there is no immediate threat. With the re-emergence of the Ebola Virus in Democratic Republic of Congo, greater care should be taken at all entry points into the country by enforcing thorough checks for Ebola virus on all passengers to avoid a repeat of the Ebola crisis in Nigeria.

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