

Marketing of Brush-Tailed Porcupine (*Atherurure africanus*) Meat in Côte d'Ivoire, Characterization of Sellers and Profitability of Trade in Abidjan

Kouassi Konan Thierry¹, Kimsé Moussa^{1*}, Yapi Jean Noel¹, Sangaré Sidiki¹, Kouame Konan Seraphin²

¹Laboratory of Animal Biology and Cytology, Animal Production Research Center (Pôle de Recherche Production Animale), NANGUI ABROGOUA University, 02 BP801 Abidjan 02, Côte d'Ivoire

²Mathematics and Computer Science, Felix Houphouet Boigny University, Côte d'Ivoire

*Corresponding author: Kimsé Moussa

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Abstract: The aim of this work was to characterize brush-tailed porcupine or African atherure (*Atherurus africanus*) meat trade in the markets of Abidjan District. The study was conducted between February 2021 and January 2022. The data were collected with 46 seller in three markets of Abidjan. These were “Marché Gouro de Yopougon” market (MGY), “marché Gouro d'Adjamé” market (MGA) and “Marché Abobo Gare” market (GA). Visits and interviews were carried out at morning each week. Results showed that all sellers in 3 markets were female and Ivorian (100%). These sellers came from four cultural groups. Akan Group represented more than half of sellers (54%). They were 26%, 44% and 50% higher than Gouro, Krou and Mandé group respectively ($P < 0.01$). Merchants aged from 18 to 61 years. Sellers aged from 25 to 40 were 54.35%. This rate was 24 and 39% higher than 18-25 and >40 age respectively ($P < 0.01$). Unmarried vendors were about 3 times higher than married ones (72% vs 28%; $P = 0.01$). A rate of 52% of atherure meat traders had never been to school. They were 30% higher than those who completed primary school in Côte d'Ivoire ($P < 0.01$). They were also 39% more numerous than those who had completed high school and university. Atherure's trade had generated a turnover of 189 million for 9000 carcasses sold. This meat was the most sold after the grasscutter. None animals were farmed. They were poached. Most of animals (28.4%) came from the forest area of Lôh-Djiboua region.

Keywords: African Atherure, game, breeding, economic, marketing, poaching.

1. INTRODUCTION

Bush meat is an important meat for rural and urban populations in Africa (Kouassi *et al.*, 2019). In countries such as Gabon, Central African Republic, Democratic Republic of Congo (RDC) and Côte d'Ivoire, it is an important source of animal protein and economic activity (Fargeot, 2013). In these countries, annual consumption of bush meat was 5 kg per year and per capita (M'Bete, 2012). Bush meat contributed 1.4% of GDP against 1% for livestock in 2000 (Caspary, 2000). Bush meat trade was therefore very important economic activity. *A. africanus* is a game highly appreciated in Côte d'Ivoire. African brush-tailed porcupine is the most popular rodent in Gabon and even in Côte d'Ivoire (Jori *et al.*, 1998). Indeed, out of a total of 35.5 million wild animals slaughtered in 1996, 6 million African atherure were killed (Caspary & MOMO, 1998). Atherure alone accounts for nearly 17%

of the wild animals slaughtered. This demonstrates the importance of this animal in bush meat economy. In the markets of Ivorian large cities such as Abidjan, Bouaké, Dalo and along the main roads leading to these towns, many sellers of this game are observed. Despite important economic role played by *A. africanus*, there is very little data on the actors and areas where this rodent is harvested. Our objective is to develop *A. africanus* breeding in Côte d'Ivoire. This study had three immediate objectives. The first was to prove that atherure trade is profitable. The second was to show that *A. africanus* meat is in high demand by consumers in Abidjan. The third objective was to determine the sampling areas of *A. africanus* that supply Abidjan.

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2. MATERIAL AND METHODS

Survey Form and Data Collection Area

An investigation sheet was used to collect data from 46 *A. africanus* dealers on three game markets in Abidjan city. It consisted of two parts. The first part was to establish the economic and social characteristics of sellers. The questionnaire sought information on seller. The second part focused on animals, in particular the supply zone, packaging and economic aspects. The study was carried out from February 2021 to January 2022. Three collected site in Abidjan were studied. These three collection sites were the major bush-meat sales markets in Abidjan. These markets were located in the municipality of Yopougon, Adjamé and Abobo. Municipality of Yopougon is located north of Abidjan. Its market studied was named "Marché Gouro de Yopougon" (MGY). Adjamé is located in the center. Its bush-meat market was named "Marché Gouro d'Adjamé" (MGA). Abobo market is located east. Its market was named "Marché d'Abobo Gare" (AG). Selection criteria for these markets were the availability of bush-meat all times of the year.

Data Collection Method

The prospection had started with a pre-survey. It was conducted for 3 months, from November 2020 to January 2021. It made it possible to draw up final survey sheets. Following this preliminary investigation, three major bush-meat markets were selected for investigation phase. It was conducted for 12 months, from February 2021 to January 2022. Data was collected from 46 bush-meat vendors. Each vendor was given 3-5 minute introductory presentation on objectives and expected results of the study. This investigation took place in two stages. The first dealt directly with sellers, social and economic role of bush-meat, importance of *A. africanus* and impact on environment. These interviews were conducted in markets. Each vendor was interviewed once. This investigation concerned qualitative and quantitative data on sellers and their merchandise. Gender, age, cultural group, marital status, educational level and sales motivation were obtained for the socio-economic characterization of bush-meat sales. Animal carcasses

and African atherure were directly counted. This count showed the importance of atherure in bush-meat business. Animals capture method and carcasses packaging method were observed. The origin of bush-meat has been determined to assess areas of high pressure for *A. africanus* collecting in Côte d'Ivoire. The economic study was carried out by collecting the purchase price and sale price. The selling price was determined on a per kg basis using a scale. The average monthly income of sellers in a market was estimated using average monthly income of all sellers in market. This income was calculated on the basis of seller's declaration.

Statistical Analysis

The estimated percentage data were tested using a G-test. It compared the proportions of bush-meat sellers in three markets (MGY, MGA and GA) for each parameter. It tested level of difference between groups at 5% significance level. R software version 3.1.3 was used during this work. These parameters were cultural group, gender, marital status, educational level and motivation for bush-meat trade in the three markets.

3. RESULTS

All bush-meat vendors in 3 markets were female. No men were met. All vendors were also *Atherurure africanus* sellers.

Social and economic characteristics of *A. africanus* sellers in Abidjan District *Distribution of A. africanus saleswomen according to their cultural group.*

Table 1 shows the distribution of sales women according to culture or ethnic groups in three markets. All vendors were Ivorian. Four (4) cultural groups were met. The Akan Group accounted for more than half of sellers met (54%) in 3 markets. They were nearly double that of Gouro, 5 and more than 10 times that of Krou and Mandés respectively ($P = 0.01$). Akan were more common in MGY (32%). This proportion was 2.3 times that of GA and 3 times that of MGA ($P = 0.03$).

Table 1: Distribution of ethnic or cultural groups of *Atherurure africanus* traders

Cultural Group	Market (%)			Total (%)	Probability	
	GA	MGA	MGY		G-test	P-Value
Number of sellers	7	15	24	46		
Akan	13,04 ^{bA}	10,86 ^{ABa}	32,60 ^{Ab}	56,5 ^A	7	0,03
Gouro	2,17 ^{bB}	13,04 ^{Aa}	13,04 ^{aB}	28,25 ^B	3,84	0,01
Krou	0	6,52 ^B	4,34 ^C	10,86 ^C	2,80	0,24
Mandé	0	2,17 ^B	2,17 ^C	4,34 ^D	1	0,61
Total (%)	15,21 ^b	32,60 ^a	30,41 ^a	100	6,88	0,03
Probability						
G-test	7,76	8,55	44,24	9,43	-	-
P-Value	<0,005	0,04	< 0,01	0,01	-	-

G A: Marché Abobo; MGA: Marché Gouro Adjamé; MGY: Marché Gouro Yopougon; a, b, c: the proportions of the same line surmounted by different letters are significantly different ($P \leq 0.05$). A, B, C, D, The proportions of the same column surmounted by different letters are significantly different ($P \leq 0.05$).

Age of Bush-Meat Traders

Average age of merchants was 34 years Table 2. The minimum age met was 18 years and maximum was 61 years. Merchants between aged from 25 to 40

were more numerous (P < 0.05). They represented 54.35% of sales women. This proportion was 1.8 times higher than that of merchants aged from 18 to 25 and 3.6 times higher than that of merchants aged over 40.

Table 2: Distribution by age group of *Atherurure africanus* traders in the Abidjan District

Merchant age	Market (%)			Total (%)	Probability	
	GA	MGA	MGY		G-test	P-Value
Number of sellers	7	15	24	46		
18 à 25	4,34 ^b	19,56 ^{aA}	6,52 ^{bb}	30,42 ^B	13,36	<0,01
25 à 40	8,70 ^b	8,70 ^{bb}	36,95 ^{aA}	54,35 ^A	13,52	<0,01
≥40	2,17 ^b	4,34 ^{bb}	8,70 ^{ab}	15,21 ^C	4,36	0,11
Total (%)	15,21 ^c	32,6 ^b	52,17 ^a	100	20,51	<0,01
Probability						
G-test	4,36	5,2	20,52	10,73		
P-Value	0,11	0,01	<0,01	<0,01	-	-

G A: Marché Abobo; MGA: Marché Gouro Adjamé; MGY: Marché Gouro Yopougon a, b, c: the proportions of the same line surmounted by different letters are significantly different (P < 0.05). A, B, C, D: The proportions of the same column surmounted by different letters are significantly different (P < 0.05).

Marital Status of Vendors

In the 3 markets surveyed, there were more single traders (71.7%) than brides in Table 3. The proportion of single traders was 2.5 times higher than

that of married (P=0.01). However, GA recorded more persons living with a partner (15.21%) than other two markets. This proportion was double that of MGA and MGY (P=0.02).

Table 3: Marital status of *Atherurure africanus* traders in Abidjan's game markets

Marital status	Market (%)			Total (%)	Probability	
	GA	MGA	MGY		G-test	P-Value
Number of sellers	11	14	21	46		
Single	8,70 ^c	23,91 ^b	39,13 ^a	71,75	19,36	0,01
Married	15,21 ^a	6,52 ^b	6,52 ^b	28,25	5,34	0,07
Total (%)	23,91 ^c	30,43 ^b	45,65 ^a	100	7,46	0,02
Probability						
G-test	1,77	9,94	10,71	23,30	-	-
P-Value	0,2	0,01	<0,01	0,01	-	-

G A: Marché Abobo; MGA: Marché Gouro Adjamé; MGY: Marché Gouro Yopougon; a, b, c: the proportions of the same line surmounted by different letters are significantly different (P < 0.05). A, B: The proportions of the same column surmounted by different letters are significantly different (P < 0.05).

Educational Level of *Atherurure Africanus* Vendor

Table 4 shows education level of *A. africanus* traders in three markets. *A. africanus* trade was dominated by out-of-school people with 52.2% of traders. This proportion was 2.4 times higher than that

of primary school. It was also 4 times higher than that of secondary school and university level merchants (P < 0.01). However, total number of sellers who completed university and secondary levels represented 26% of *A. africanus* sellers in Abidjan.

Table 4: Level of study of traders surveyed in Abidjan's *Atherurure africanus* markets

Level of Education	Marché (%)			Total (%)	Probabilité	
	GA	MGA	MGY		G-test	P-Value
Number of sellers	7	15	24	46		
Out of school	8,70 ^c	13,04 ^b	30,43 ^{aA}	52,18 ^A	14,74	0,01
Primary	6,52	6,52	8,70 ^B	21,74 ^B	0,43	0,80
Secondary	0	6,52	6,52 ^B	13,04 ^B	0	1
University	0	6,52	6,52 ^B	13,04 ^B	0	1
Total (%)	15,22 ^c	32,6 ^b	52,17 ^a	100	20,52	<0,01
Probabilité						
G-test	0,31	3,91	31,15	41,40	-	-
P-Value	0,06	0,3	<0,01	<0,01	-	-

G A: Marché Abobo; MGA: Marché Gouro Adjamé; MGY: Marché Gouro Yopougon; a, b, c: the proportions of the same line surmounted by different letters are significantly different ($P < 0.05$). A, B, C, D: The proportions of the same column surmounted by different letters are significantly different ($P < 0.05$).

Principal Reasons of *Atherurure africanus* Trade in Abidjan

The main reasons for the trade in wildlife have been classified into three groups Table 5. The first groups was people having this trade as the only means of subsistence (business). A second group was sellers who inherited this business from their parents (inherited). The last group was others with various

reasons (passion). Business group represented about 87% of bush-meat merchants. They were 10 and 12 times higher than inherited group and passion group respectively ($P < 0.01$). MGY had more business group (54%). They were about 2 and 5 times higher than MGA and GA respectively ($P < 0.01$). Passion group was MGY only. It was too few (4%) in total vendors.

Table 5: Reasons for *Atherurure africanus* trade

	Market (%)			Total (%)	Probability	
	GA	MGA	MGY		G-test	P-Value
Number of sellers	5	11	30	46		
Business	10,87 ^c	21,74 ^{bA}	54,34 ^{aA}	86,95 ^A	16,25	<0,01
Inherited	0	2,17 ^B	6,52 ^B	8,69 ^B	2,17	0,14
Passion	0	0	4,35 ^B	4,35 ^B	4	0,13
Total (%)	10,87 ^c	23,91 ^b	65,21 ^a	100	48,29	<0,01
Probabilité						
G-test	10	16,54	33,8	59,65	-	-
P-Value	-	<0,01	<0,01	<0,01	-	-

G A: Marché Abobo; MGA: Marché Gouro Adjamé; MGY: Marché Gouro Yopougon; a, b, c: the proportions of the same line surmounted by different letters are significantly different ($P \leq 0.05$). A, B, C: The proportions of the same column surmounted by different letters are significantly different ($P < 0.05$).

Supply Areas in *Atherurure africanus*

Figure 1 shows origins of animals that were sold in Abidjan markets. Nine administrative regions of Côte d'Ivoire supplied Abidjan's markets with atherure meat during this study. MGY was supplied by all 9 regions. Majority of atherure carcasses came from

“Lôh-Djiboua” region and “Sassandra” regions ($P < 0.05$). The amount of atherure collected in “Bas Sassandra” region was 2.2 times higher than that obtained in Gbêkê region ($P < 0.05$). Regions brought very few *Atherurure* carcasses to Abidjan markets.

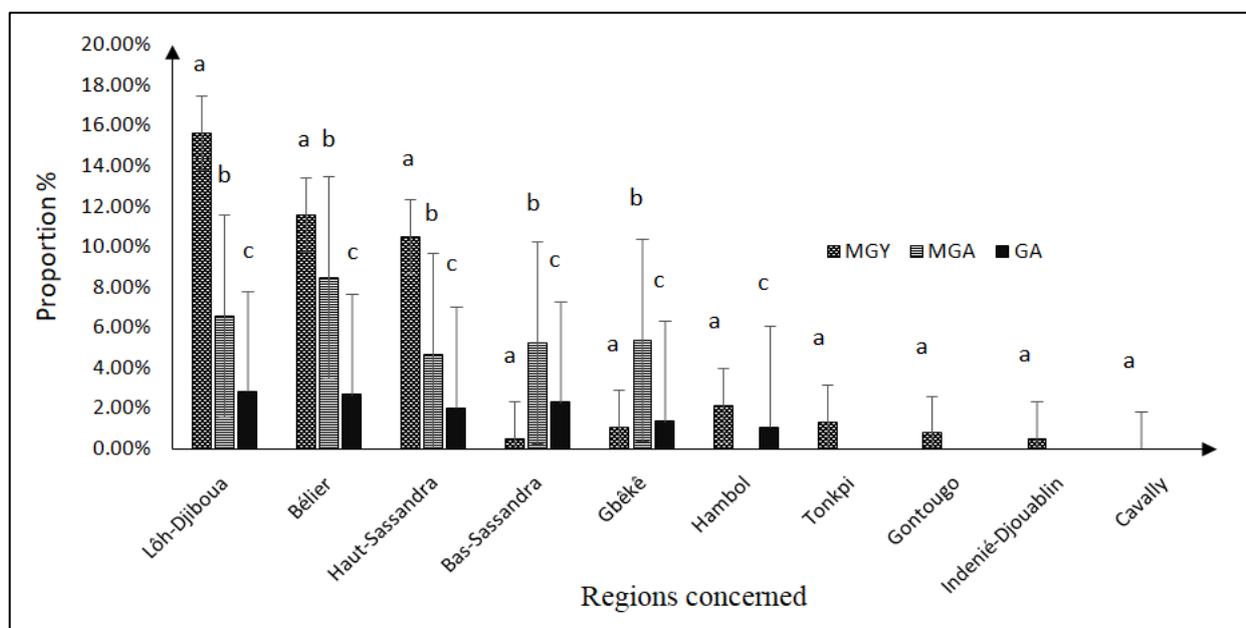


Figure 1: Regions supplying Abidjan markets with *Atherurure africanus* meat
a, b, c: histograms with different letters are significantly different at the probability alpha= 0.05

Contribution of Brush-Tailed Porcupine to Bushmeat Trade

Figure 2 shows contribution of brush-tailed porcupine to bush-meat trade in markets in Abidjan. 54 204 carcasses of 23 species were inventoried. These animal species represented 305513.4 kg of biomasses marketed during the study. The species most encountered on market were *Thryonomys swinderianus*, *Atherurus africanus*, *Cephalophus monticola*, *Cricetomys*, *Chitoptera* and *Glaucamys sabrinus*. Grasscutter (*T. swinderianus*) and brush tailed porcupine (*A. africanus*) were the most numerous on markets. The two rodents accounted for 37% of bushmeat in Abidjan markets. However, grasscutter was encountered more than African brush-tailed porcupine (16.42%) ($P < 0.05$). Then, duikers (10.93%) and gambian rats (7.80%) were the most encountered. Bats had a proportion similar to that obtained with flying squirrels (7.61%). Pangolin (4.80%), partridge (4.25%), wild guinea fowl (4.04%) palm-tree rats (3.40%), varans (3.09%) and squirrels (3%) were observed. Less

important were antelopes (1.85%), black dorsal-banded cephalophs (1.41%), civettes (1.15%), harness handlebars (1.08%), savannah hares (0.88%), and mongooses (0.81%).

Method of Animals Capturing

No animals came from breeding. All animals were wild animals. The modes of capture recorded were 4 modes Table 6. All atherures were captured by hunting. These are hunting by firearm, by collective hunting with dogs, by trapping and undetermined capture. The most common method of capture is shooting (53.80%). This proportion was 2.3 times higher than that captured by hand with hunting dogs, which was 23.40% ($P < 0.01$). Trapping recorded a third of the animals caught with hunting dogs. However, animals whose mode of capture was not determined was 9.4 times lower than those killed by rifles ($P < 0.01$). Atherure collected by firearm in MGY were higher than all capture mode in other market ($P < 0.01$).

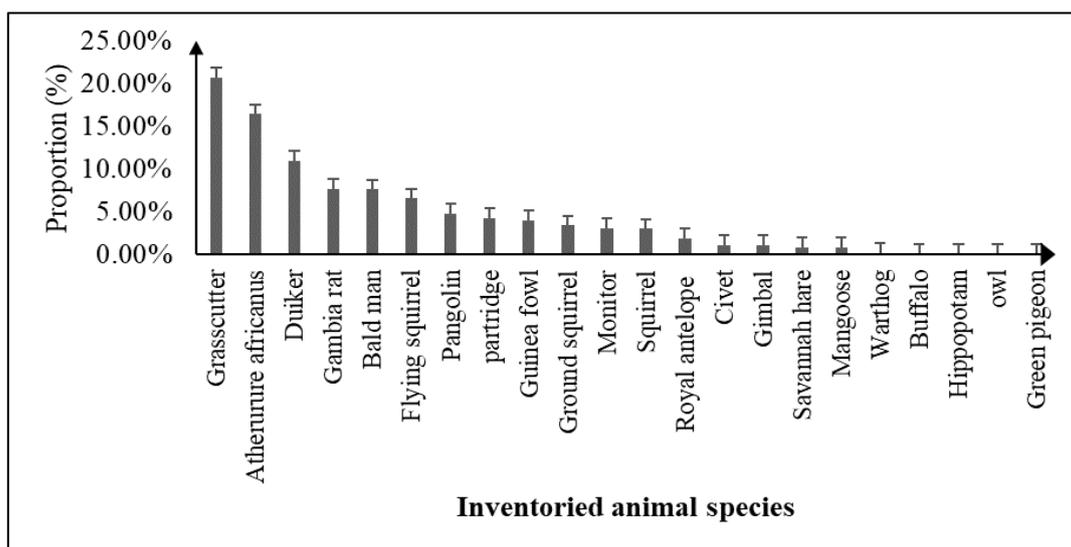


Figure 2: Contribution of brush-tailed porcupine *Atherurus africanus* to the bush-meat in Abidjan markets

Table 6: Mode of Wildlife Capture

	Market (%)			Total (%)	Probability	
	GA	MGA	MGY		G-test	P-Value
Number of sellers	593	1379	2545	4517		
Firearm	6,57 ^c	16,20 ^{bA}	31,01 ^{aA}	53,78 ^A	16,91	<0,01
Collective hunting	2,70	5,86 ^B	10,40 ^B	18,96 ^B	4,5	0,10
Trapping	1,60	3,74 ^B	6,24 ^B	11,58 ^B	2,80	0,24
Indetermined	2,25	4,71 ^B	8,67 ^B	15,68 ^B	4,03	0,13
Total (%)	13,12 ^c	30,51 ^b	56,32 ^a	100	28,36	<0,01
Probability						

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G-test	4,6	13,14	27,76	45,33	-	-
P-Value	0,20	< 0,01	< 0,01	< 0,01	-	-

G A: Marché Abobo; MGA: Marché Gouro Adjamé; MGY: Marché Gouro Yopougon a, b, c: the proportions of the same line surmounted by different letters are significantly different ($P \leq 0.05$). A, B, C: The proportions of the same column surmounted by different letters are significantly different ($P < 0.05$).

Atherure Meat Marketing

There were two types of brush tailed porcupine marketing in Abidjan (Table 7). *A. africanus* was smoked or sold fresh frozen or not. Smoked meat was more than 2 thirds of sales (69.14%). On the other hand, sale in fresh state (whether frozen or not) was 30.83 %.

This form was 2 times less important than smoked form ($P < 0.01$). Smoke form in MGY was 4.73 and 1.8 times higher respectively than GA and MGA ($P < 0.01$). The fresh form in MGY was 3.5 and twice higher than GA and MGA respectively ($P < 0.01$).

Table 7: Marketing of *Atherure africanus* meat

	Market (%)			Total (%)	Probability	
	GA	MGA	MGY		G-test	P-Value
Number/month	593	1379	2545			
Fresh	4,87 ^b	8,70 ^{bB}	17,26 ^{aB}	30,83 ^B	7,83	0,02
Smoked	8,25 ^c	21,82 ^{bA}	39,07 ^{aA}	69,17 ^A	20,70	<0,01
Total (%)	13,12 ^c	30,52 ^b	56,33 ^a	100	28,36	<0,01
Probability						
G-test	0,87	5,64	8,45	14,7	-	-
P-Value	0,35	0,02	<0,01	<0,01	-	-

G A: Marché Abobo; MGA: Marché Gouro Adjamé; MGY: Marché Gouro Yopougon; a, b, c: the proportions of the same line surmounted by different letters are significantly different ($P < 0.05$). A, B: The proportions of the same column surmounted by different letters are significantly different ($P < 0.05$).

Economic Assessment of the *Atherurure Africanus*

Number of atherure carcass was 8904 (Table 8). The weight can be estimated at 23432 kg. The average purchase price in all three markets was 8379 ± 3227 FCFA. Price was expensive at MGY than MGA and GA. Price in MGY and MGA was 1.2 and 1.16 times higher than GA respectively ($P < 0.01$). The same observation was made on the selling price atherure

carcasses to consumers. In this work, profit accumulated by saleswomen on MGY was CFAF 33 512 100. This profit was 4.7 and 1.8 times higher than MGA and GA merchants respectively. The trade in the meat of African brush-tailed porcupine generated on average $19\,480\,022 \pm 6\,380\,903$ FCFA to traders during the 12 months of study.

Table 8: Trade performance of *Atherurure africanus*

Market				Mean	CV	P > F
	MGY	MGA	GA			
Number of seller	24	15	7	15		
Atherure number/year	5100	2712	1092	2968		
Purchase Price [§]	9681±3475 ^b	9000±3721 ^b	7769±2710 ^a	8378±3227	0.38	<0.01
Sale Price [§]	16252±5177 ^b	15723±6074 ^b	14245±4906 ^a	14942±5376	0.36	<0.01
Profit [§]	6571±1702	6723±2352	6476±2196	6563±2149	4,71	0,09

G A: Marché Abobo; MGA: Marché Gouro Adjamé; MGY: Marché Gouro Yopougon; CV: Coefficient of Variation a, b: the averages of the same line surmounted by the same letter did not present any significant differences ($P < 0.05$); [§]1€=655FCFA

4. DISCUSSION

Atherurure africanus meat traders in Abidjan's markets were all women. The absence of men can be explained by the fact that bush meat trade is considered not profitable enough for men. This partly explains disinterestedness of men in atherure trade. In addition, bush meat seller is almost exclusively reserved for women in many African countries. Thus, in Cameroon, more than 84% of sellers were women (Edderai and Dame, 2006). In contrast, in Congo-Brazzaville, 48% of men were bush meat sellers (Mbeté et al., 2011). Men

are thought to be at the beginning of bush meat trade chain in Côte d'Ivoire. They were exclusively hunters. Young people were found in *A. africanus* meat sellers. That could be explained by the lack of jobs. Young graduates would choose this trade to avoid prolonged unemployment. This business is a temporary business for them. This is the main reason why more than ¼ of saleswomen had high school and university. The most exposed age group is between 18 and 40 years of age, which represented 85% of vendors. They are also single women who are more at risk of urban poverty. This

poverty was estimated at more than 23% of the population in Abidjan (Ducroquet *et al.*, 2017). The same observation was made in Brazzaville where 26% of sales women lived as a couple (Mbete *et al.*, 2011). African brush-tailed porcupine business is also cultural. Indeed, Akan ethnic group was the majority because these Akan women were the most involved in traditional catering in Côte d'Ivoire. Most traditional restaurants are owned by Akan women. These are supplied by their fellow sellers of bush meat in markets. Bush meat such as *Tryonomus sunderianus* (grasscutter) and *A. africanus* (African atherure) are an essential ingredient for this type of restaurant. Akan sellers have permanent customers for the flow of their merchandise. This justifies the low number of Mandé group who is absent in traditional catering in Abidjan.

The most exploited animals were *T. sunderianus* (grasscutters) and *A. africanus* (African atherure) which represented respectively 21 and 16.5% of bush meat in market. These rodents are observed in forest and large fallow areas. These animals find their food easily and are safer because human activity is reduced in these areas. This was observed in Congo by Rahm (1962). Indeed, Fa *et al.*, (2000) found that the majority of wild meat that supplied Brazzaville came from protected areas such as the wildlife reserves of Mount Mfouari, Tsoulou and southern Nyanga. This justifies why the majority of African atherure carcasses observed came from the regions of Lôh-Djiboua, Bélier, Bas-Sassandra and Haut-Sassandra. These regions have classified forests or protected areas which constitute favorable ecosystem for african brush-tailed porcupine. Lôh-Djiboua and Bélier area were the two large reservoirs caused by their proximity and easy access (butumed roads and highway). On the other hand, atherure carcasses from Administrative Regions of Sassandra, especially those of Tonkpi and Cavally is a sign of the depletion of stocks. This leads vendors to go further into areas where access is difficult to obtain supplies. Sale in the smoked form is a traditional conservation method which makes it possible to transport slaughtered animals from remote areas or whose access is difficult.

The business of atherure is an economically profitable activity. This justifies the large number of graduates in this business. It provides direct benefits at three levels of value chain. At the first level, these are the wholesalers who are hunters or other intermediary people buying on the field to supply big cities markets. Thus, over a year of study, nearly 9000 African brush-tailed porcupine carcasses were marketed. Total weight was about 23.5 tons of atherure or more than 16% of bush meat marketed. The price of animal ranged from 5 000 to 11 000 CFAF in 2021. This first level had raised between 45 million and 99 million FCFA (68 700€ and 151 145€) for these three markets. The second level is market sales. The selling price of atherure carcass ranged from 10 000 to 21 000 FCFA. This represented a

turnover of 90 million to 189 million FCFA (137 400€ and 288 550 €) for sales women. The third level, which was not the subject of this study, was catering. However, price of selling *A. africanus* meat in Ivorian restaurant can be estimated at between 25 000 and 35 000 FCFA. The Turnover related to atherure sale could easily reach 315 million FCFA (480 916€). Contrary to Jori *et al.*, (1998) observations, *A. africanus* breeding is nowadays a profitable activity in Côte d'Ivoire.

CONCLUSION

The trade of *Atherurus africanus* whose common names are African atherure or African brush-tailed porcupine is an exclusively female activity in Côte d'Ivoire. It mainly concerns single women aged from 18 to 61 years. One-quarter of atherure sellers have a secondary or university education. Vendors of the three main markets of Abidjan city realize an annual turnover which can be estimated at nearly 189 million CFA francs for the sale of approximately 9 000 atherure carcasses. Brush-tailed porcupine is the second most commercialized bush meat species after grasscutter. The favored sites of origin for Abidjan markets are the zones near the protected areas of Lôh-Djiboua, and Bélier, which are more accessible and closer. However, increasingly remote supply areas are synonymous with depletion of stocks linked to high hunting pressure. Atherure breed in (Atheruculture) has triple interest. The first interest economic. Unlike a few years ago, atherure breeding can be profitable. A nutritional and sociological interest that allows to preserve the eating habits of Ivorians are a second interest. The third interest is environmental interest, atheru culture will help to preserve *A. africanus* species. Breeding can be an alternative to hunting and preserving biodiversity.

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