

Short Communication

A census of the commercial bushmeat market in Yaoundé, Cameroon

David Edderai and Mireille Dame

Abstract Bushmeat is a major food and economic resource in sub-Saharan Africa, and with increasing urbanization bushmeat consumption has spread from villages to cities. To facilitate long-term monitoring of the bushmeat market in Yaoundé, Cameroon, we carried out a baseline survey of the transportation routes of bushmeat into the city and of urban bushmeat sales. We inventoried all bushmeat sales points, and located 15 markets and 145 restaurants and cafeterias selling an estimated total of 1,052 bushmeat dishes per day. This trade provides an occupation for 249 people, of whom 84.3% are women. Trains from Ngaoundere in the north and minibuses from the east supply more than 70% of

the sales points in the Elig-Edzoa market, located next to the railway, and the Nkoldongo bus station. From these two places bushmeat is redistributed to other commercial sites within the city. The routes into Yaoundé transport bushmeat from a vast area of the country and in particular from the savannah and central provinces, which are rich in wildlife and contain National Parks and safari hunting areas. However, overall, bushmeat consumption at commercial outlets in the city is low relative to the number of inhabitants.

Keywords Bushmeat, Cameroon, transport routes, urban markets, Yaoundé.

In sub-Saharan Africa bushmeat makes a significant contribution to human protein intake (Asibey, 1974; Hladik *et al.*, 1989; Redford, 1993; Chardonnet, 1995; Delvingt, 1997; Bahuchet & Ioveva, 1999; Wilkie & Carpenter, 1999; Barnett, 2000; Delvingt *et al.*, 2001; Rao & McGowan, 2002), and with increasing urbanization bushmeat consumption has spread from villages to cities (Steel, 1994; Bahuchet & Ioveva-Baillon, 1998; Caspary, 1999). As part of the Development of Alternatives to Poaching in Central Africa project funded by the EU and carried out by the French Agricultural Research Centre for International Development, we censused the bushmeat markets, cafes and restaurants in Yaoundé, Cameroon. Our objectives were to make a baseline survey of the transportation routes of bushmeat into the city and of bushmeat sales within the city to facilitate long-term monitoring of the bushmeat market.

Yaoundé, capital of Cameroon, is divided into six subdivisions and the estimated total population in 2003 was 1,416,674 (Records of Yaoundé Urban Community). The main transport routes are by rail (the northern Ngaoundere - Yaoundé line) and four major roads: from

Bafoussam in the north-west, Douala in the south-west, Ebolowa and Sangmelima in the south, and Bertoua in the east (Fig. 1). Bushmeat sales points were inventoried using a map of the city drawn in 2000 by the National Institute of Cartography. Each street was visited once. The geographical coordinates of sales points were noted using a Global Positioning System and were classified as (1) cafeterias (food is sold on the street, comfort and services are limited, prices are low), (2) restaurants (infrastructures of durable materials, the consumer is relatively comfortable and prices are meant for average to wealthy clientele), and (3) market retailers. The number and sex of sellers was noted and the sellers were interviewed about the origin and type of their bushmeat suppliers. For each sales point we determined the number of traders and selling tables, and the average number of bushmeat dishes sold each day.

We identified 160 sales points (15 markets, 102 restaurants and 43 cafeterias), 75.6% of which were concentrated in three subdivisions, and at which 84.3% of the 249 sellers were women. We categorized markets into four classes based on the number of tables from which bushmeat is sold (Table 1). One-third of the total of 83 tables are in the Elig-Edzoa market. The number of bushmeat traders and tables in the markets decrease with distance from the railway line (Table 1), indicating the prominent role played by the railway in the transportation of bushmeat. The Elig-Edzoa market is next to the railway and is supplied exclusively by this route. All the bushmeat sold in the Inter Voyage market

David Edderai* (Corresponding author) and Mireille Dame
Projet Développement d'Alternatives au Braconnage en Afrique Centrale, BP 2572
Yaoundé, Cameroun. E-mail david-edderai@netcourrier.com

Received 20 September 2004. Revision requested 21 April 2005.
Accepted 19 September 2005.

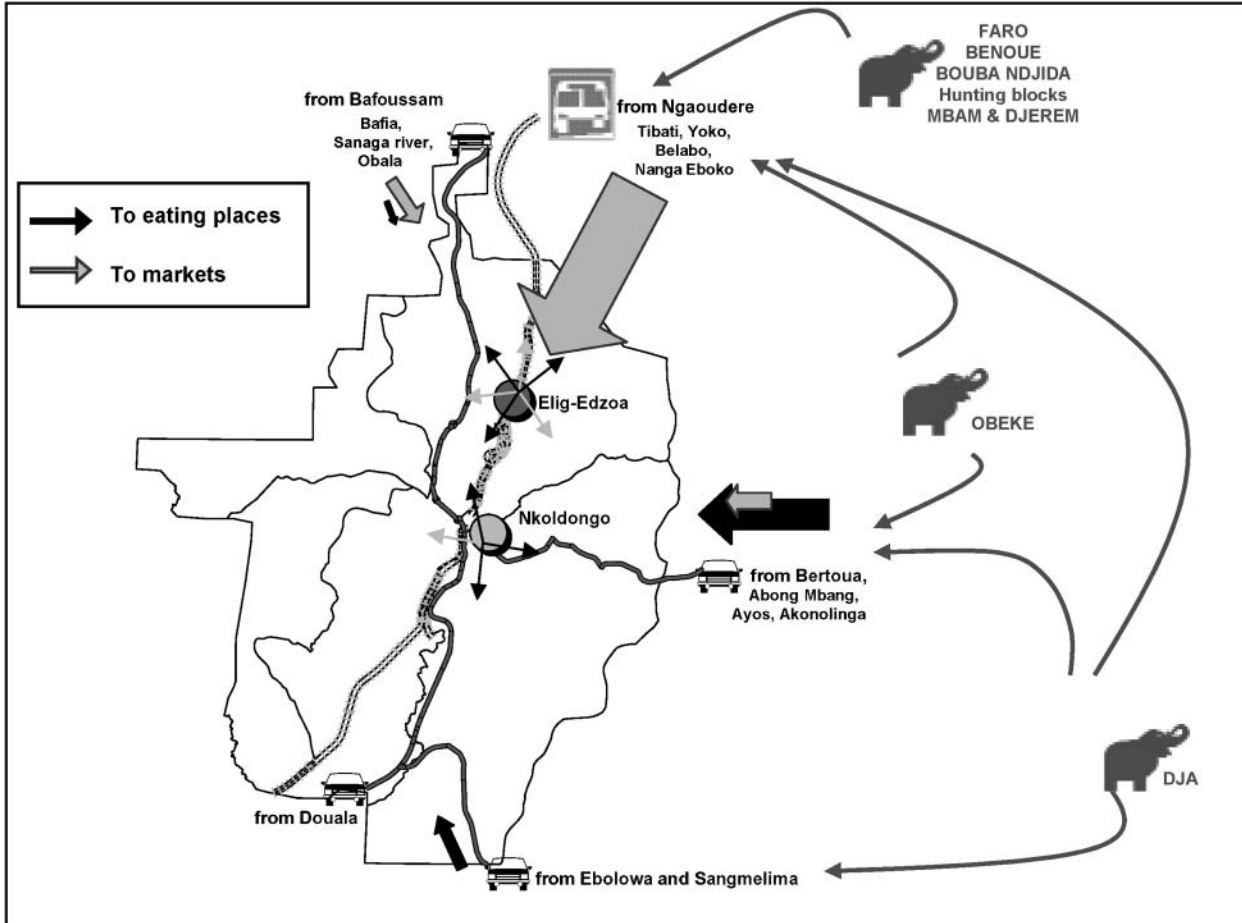


Fig. 1 The rail and road transport routes of bushmeat into the city of Yaoundé, principally to the Elig-Edzoa market located next to the railway and to the Nkoldongo bus station. The width of the arrows of bushmeat movement into the eating places and markets indicates the relative importance of each transport route. The arrows from Elig-Ezsoa and Nkoldongo indicate the redistribution of bushmeat into the city (see text for details). Protected and hunting areas are indicated in capital letters.

(of class 2; Table 1) is collected and transported by minibuses from the east to the Nkoldongo bus station. In the Mvog-Mbi market, the second largest, some traders resell products bought in Elig-Edzoa. Otherwise, the supply sources for class 2 markets vary (traders travelling out of town, on-the-spot supply by hunters or middlemen, and orders placed with transporters). Of the small markets, 70% redistribute products bought from the larger markets.

Cafeterias and restaurants were categorized by the average number of dishes of bushmeat sold per day. When there was no information on sales, the number of tables was used (Table 2). The sales of most cafeterias (88%) and restaurants (95%) were modest (<11 dishes per day) but two of the cafeterias served a total of c. 100 dishes per day. An estimated total of 417 bushmeat dishes were sold daily in cafeterias but the number of species on the menus was low (Table 3). Most of the

Table 1 Categorization of the bushmeat markets in Yaoundé into four classes based on the number of tables selling bushmeat in each market, and for each class the number of markets, mean number of traders and tables, and mean distance from the railway line.

Class	No. of tables	No. of markets	Mean no. of traders (± SD)	Mean no. of tables (± SD)	Mean distance (km) from the railway line (± SD)
1	>15	1	24	27	0.26
2	5–15	4	10 ± 2.9	9.5 ± 3.1	0.98 ± 1.37
3	2–4	5	2.6 ± 0.5	2.6 ± 0.5	2.02 ± 0.96
4	1	5	1 ± 0	1 ± 0	2.23 ± 2.05
<i>Total</i>		15	82	83	

Table 2 Categorization of cafeterias and restaurants serving bushmeat in Yaoundé into four classes based on the mean number of bushmeat dishes served per day and number of tables, and the number of cafeterias or restaurants in each class.

	Class	Mean no. of bushmeat dishes served per day	No. of tables	No. of cafeterias or restaurants
Cafeterias	a	>30		2
	b	11–30		3
	c	6–10	5–10	19 + 3
	d	1–5	1–4	11 + 5
	<i>Total</i>			43
Restaurants	A	>30		0
	B	11–30	>10	2 + 3
	C	6–10	5–10	36 + 8
	D	1–5	1–4	50 + 3
	<i>Total</i>			102

Table 3 The number of species of bushmeat served in cafeterias and restaurants (see Table 2).

	1 species	2 species	≥3 species	No. where information could be obtained
Cafeterias	72.0%	16.0%	12.0%	25 (out of 43)
Restaurants	67.6%	21.6%	10.8%	37 (out of 102)

cafeterias also sold other dishes and only seven sold bushmeat exclusively. The provenance of the bushmeat sold in cafeterias and restaurants is given in Table 4.

The number of species on restaurant menus was also low (Table 3). On the basis of 88 restaurants for which we could determine the mean number of dishes served daily and by extrapolation to all the restaurants according to their class, the estimated total number of bushmeat dishes sold daily in restaurants was 635. Eight of these restaurants serve only bushmeat.

In Abidjan, Ivory Coast, Caspary (1999) counted 110 bushmeat traders in the markets, and Malonga (1996) counted 107 in Brazzaville, Congo. To compare these figures with Yaoundé, where there is one selling table per 17,000 inhabitants, there is one per 8,350 inhabitants in Brazzaville and 1 per 32,000 in Abidjan. However,

Table 4 Provenance of bushmeat sold in cafeterias and restaurants in Yaoundé. The mechanisms of supply are not exclusive as some cafeterias and restaurants use several supply strategies.

	Cafeterias	Restaurants
Minibus drivers of Nkoldongo	51.2%	14.6%
City markets	26.8%	53.9%
Directly from collectors or hunters	26.8%	31.5%
Directly from hunting areas	0%	12.4%
No. of places where information could be obtained	41 (out of 43)	89 (out of 102)

these figures do not necessarily illustrate total bushmeat consumption as the role markets play in the supply of households will vary between cities. In Yaoundé the estimated total of 1,052 dishes of bushmeat sold each day is one dish per 1,347 inhabitants (corresponding to <1 dish per inhabitant every 3.5 years). This illustrates the minor role played by these outlets in total bushmeat consumption (4% of bushmeat consumed is eaten in restaurants and cafeterias; Edderai *et al.*, unpubl. data). Considering that individual portions have *c.* 400 g of live weight biomass, we estimate that 421 kg of bushmeat is eaten per day at these outlets.

The railway is the most important carrier of bushmeat into Yaoundé; we estimated that bushmeat transported by rail is found on 70% of the market tables and in 45% of the eating places. The other important supply route of bushmeat into the city is by minibus agencies, mainly those of Nkoldongo bus station. Drivers collect bushmeat to sell or to honour orders. Besides direct supply of two markets within the premises of these agencies, 26.2% of the cafeterias and restaurants also get their supplies from Nkoldongo. We estimate that 19.2–32.2% of the bushmeat dishes sold in the eating places of the city are made up of products bought at these minibus agencies (i.e. 2,465–4,135 kg of live weight biomass per month); this is because the bushmeat they offer is fresh (whereas bushmeat for sale in the markets is usually smoked). Cafeteria owners obtain their bushmeat primarily from the minibus agencies, whereas restaurants make greater use of the markets. We believe this is because restaurant owners prefer to buy a greater quantity of bushmeat at one time, whereas bushmeat sale in cafeterias is more opportunistic, with the owners buying fresh bushmeat during the day according to their needs and depending on the arrival of minibuses. The railway and minibus agencies combined supply 80% of the market tables and 70% of the eating places. Elig-Edzoa and Nkoldongo are also the two main redistribution sites to other urban traders.

The transport routes into Yaoundé bring in bushmeat from a vast area of the country. The railway brings bushmeat from the savannah provinces (North and Adamawa), which are rich in wildlife and where there are three National Parks (Faro, Benoue and Bouba Ndjida) and many adjacent safari hunting areas, and then crosses the Mbam and Djerem Park in the Central Province. Bushmeat is loaded at every stop (Cameroon Environmental Watch, 2000). By railway and road routes the forests of south-eastern Cameroon are also touched by these commercial hunting activities, especially in protected areas (Lobeke and Dja). In Yaoundé there is a direct link between the rail and road transport routes and the outlets for bushmeat sales within the city. The fact that most of the bushmeat trade in Yaoundé is

concentrated in the main market and bus station could provide an opportunity for improved control of this trade.

Acknowledgements

We are very grateful to the people consulted prior to this study and who shared their knowledge with us, particularly Gilles Etoga and Olivière Mouahba (Ministry of the Environment and Forestry). Special thanks go to Philippe Auzel. We also extend our gratitude to the Cartography Service of the Yaoundé Urban Community for making their computer resources available.

References

- Asibey, E.O.A. (1974) Wildlife as a source of protein in Africa south of the Sahara. *Biological Conservation*, **6**, 32–39.
- Bahuchet, S. & Ioveva, K. (1998) Le rôle de la restauration de rue dans l'approvisionnement des villes en viande sauvage: le cas de Yaoundé (Cameroun). In *Villes du Sud et Environnement* (eds D. Bley, J. Champaud, P. Baudot, B. Brun, H. Pagezy & N. Vernazza-Licht), pp. 171–182. Editions du Bergier, Travaux de la Société d'Ecologie Humaine, Marseille, France.
- Bahuchet, S. & Ioveva, K. (1999) De la forêt au marché: le commerce de gibier au sud Cameroun. In *L'Homme et la Forêt Tropicale* (eds S. Bahuchet, D. Bley, H. Pagezy & N. Vernazza-Licht), pp. 533–558. Editions du Bergier, Travaux de la Société d'Ecologie Humaine, Marseille, France.
- Barnett, R. (2000) *Food for Thought: the Utilization of Wild Meat in Eastern and Southern Africa*. TRAFFIC, Nairobi, Kenya.
- Caspary, H.U. (1999) *Utilisation de la Faune Sauvage en Côte d'Ivoire et Afrique de l'Ouest – Potentiels et Contraintes pour la Coopération au Développement*. GTZ, Eschborn, Germany.
- Cameroon Environmental Watch (2000) *Braconnage et Circulation des Produits Fauniques le Long du Rail (Axe Yaoundé – Ngaoundal)* (ed. R. Ngoufo). Rapport, Yaoundé, Cameroon.
- Chardonnet, P. (ed.) (1995) *Faune Sauvage Africaine: La Ressource Oubliée, Tome I*. Commission Européenne, Bruxelles, Luxembourg.
- Delvingt, W. (1997) *La Chasse Villageoise: Synthèse Régionale des Etudes Réalisées Durant la Première Phase du Programme ECOFAC au Cameroun, au Congo et en République Centrafricaine*. Rapport FUSAGx-ECOFAC-AGRECO, Bruxelles, Belgium.
- Delvingt, W., Dethier, M., Auzel, P. & Jeanmart, P. (2001) La chasse villageoise Badjoué, gestion coutumière durable ou pillage de la ressource gibier? In *La Forêt des Hommes. Terroirs Villageois en Forêt Tropicale Africaine* (ed. W. Delvingt), pp. 65–92. Presses Agronomiques, Gembloux, Belgium.
- Hladik, C.M., Bahuchet, S. & De Garine, I. (1989) *Se Nourrir en Forêt Équatoriale: Anthropologie Alimentaire des Populations des Régions Forestières Humides d'Afrique*. UNESCO-MAB, Paris, France.
- Malonga, R. (1996) *Circuit Commercial de la Viande de Chasse à Brazzaville*. Rapport WCS-GEF, Brazzaville, Democratic Republic of Congo.
- Rao, M. & McGowan, P.J.K. (2002) Wild-meat use, food security, livelihoods, and conservation. *Conservation Biology*, **16**, 580–583.
- Redford, K.H. (1993) Hunting in Neotropical forests: a subsidy from nature. In *Tropical Forests, People and Food: Biocultural Interactions and Applications to Development* (eds C.M. Hladik, A. Hladik, O.F. Linares, H. Pagezy, A. Semple & M. Hadley), pp. 227–246. UNESCO-MAB, Paris, France.
- Steel, E. (1994) *Etude sur le Volume et la Valeur du Commerce de la Viande de Brousse au Gabon*. Rapport WWF, Libreville, Gabon.
- Wilkie, D.S. & Carpenter, J.F. (1999) Bushmeat hunting in the Congo Basin: an assessment of impacts and options for mitigation. *Biodiversity and Conservation*, **8**, 927–955.

Biographical sketches

David Edderai is a veterinarian interested in wildlife management. He has been working on bushmeat issues and game species breeding in Central Africa for 7 years. He is currently working in Zakouma National Park in Chad.

Mireille Dame is an agronomist specialising in forestry. She worked as a field research team leader on the Mengame gorilla sanctuary in Cameroon and then as a field research assistant on the project Développement d'Alternatives au Braconnage en Afrique Centrale.