



Choice Criteria of Village Chickens Sold at Different Markets in N'Djamena, Chad

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Abstract | The study identified the criteria to choice village chickens sold in N'Djamena. To achieve the objective, a monitoring of their sale in different markets was conducted. The weight, sex and price of chickens were recorded after completion of the transaction between the customer and the seller. Housewives (62.7%), street braisers (25.4%) and restaurant operators (11.9%) were the customers. Out of 1097 chickens concerned, females were in large numbers (65.2%). Males were significantly ($P < 0.05$) heavier (1130 g) than females (878 g). The average price of males (3,282 F CFA (CFA France); African Financial Community Franc; One Euro = 655.987 F CFA) was higher ($p < 0.05$) than that of females (2,814 F CFA). Weight and price were significantly correlated ($p < 0.001$; $R = 50.8$). Housewives acquired preferably heavier chickens ($p < 0.05$) than those of restaurant operators (910 g) and braisers (838 g). The average price (3,141 F CFA) for chickens paid by household was significantly higher ($p < 0.05$) than restaurant owners (2,705 F CFA) and braisers (2,698 F CFA). Unlike braisers and restaurant operators, housewives buy mostly heavier fowls. Thus, domestic (at home) or commercial (out-of-home) use of chickens acquired in the markets of N'Djamena significantly directs customer preference. The proven existence of a demand for less heavy chickens requires some orientation of poultry farmers towards young poultry production to meet the needs of these customers.

Keywords | Village chickens, Choice criteria, Market, N'Djamena, Chad

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INTRODUCTION

The semi-industrial poultry farms are struggling to meet the needs of urban consumers in chicken meat (Mopaté, 2010a; Mopaté et al., 2014). This has led to increased trade of traditional chickens in urban centers, particularly in N'Djamena (Mopaté, 2010b). Thus, the rural or peri-urban family chicken farms become a speculative activity geared towards supplying the cities (Mopaté, 2010b; Issa et al., 2012b) same as the production of commercial farms (Olasunkanmi et al., 2013).

In N'Djamena, the sale of traditional chickens is done in

six (6) major markets. The average daily sale was estimated at 3,405 chickens (Issa et al., 2012b). This figure shows an increase in sales of chickens in the city, compared with the previous data of 1,556 heads in 2001 (Mopaté, 2010b). Moreover, the number of traders identified in these markets rose from 151 individuals in 2001 to 220 in 2012 (Mopaté, 2010b; Issa et al., 2012b). Increased sales and traders illustrate the development of the sector, due to the increase in demand.

Chickens are consumed both in the household and outside the home at the food processors' place. These agents offer their customers whole or carved processed chicken (Issa et

al., 2012a). Observations made in food processing areas and at markets indicate that weight, sex and prices are likely to influence the choice of chickens by customers. Hence the assumption that each category of customers acquires chickens according to their criteria and processing objectives.

Thus, the purpose of this study was to identify the types of customers and their criteria for selecting village chickens sold in the markets, in order to guide production so as to meet demand from consumers' niches.

MATERIALS AND METHODS

STUDY SITE

The study was conducted in N'Djamena, the capital city of Chad. The city lies between the 12th and the 13th degree North latitude and the 15th and 16th degree East longitude. N'Djamena is a border city with Cameroon, located at the confluence of two great rivers, the Logone and the Chari. The city has 10 districts, six of which have each a poultry market. N'Djamena provides political, economic, administrative, industrial (especially processing industries) and intellectual services. The city hosts the headquarters of many diplomatic missions and non-governmental organizations (NGOs). It is home to 900,000 inhabitants since the last population census (MEP, 2009) and is thus an important consumption centre.

SAMPLING AND DATA COLLECTION METHODS

In each of the six (6) major markets (Farcha, Central market, Champ Fil, Diguel, Al Afia and Dembé) selling village chickens, chickens actually sold were the subject of observations on weight, sex and cost. These parameters were recorded only at the time of completion of the transaction, as is the type of customers (housewife, restaurant operator, street braisers or roaster, etc.). Weighing was carried out using the poultry 3 kilogram (kg) spring balance, with 20 g precision. The chickens have been fettered by the legs using a tarred cord and then suspended to the balance hook.

STATISTICAL ANALYSIS

The data was entered using Excel spreadsheet and transferred to the SPSS version 17 (SPSS, 2009) for descriptive and variance analysis. The mean differences on quantitative data (weight and price) were sought on such factors as gender, types of traders, customers and markets at 5% threshold. The weight and price correlation was also sought.

RESULTS

FREQUENCIES AND PERCENTAGES OF OBSERVATIONS

The frequencies and percentages of chickens per category of traders and customers have shown that retailers sold more while, among customers, it is mostly housewives who bought a lot (Table 1).

Table 1: Absolute and relative frequencies of chickens per category of traders and customers in the markets of N'Djamena, Chad

Frequency of Traders	%	Frequency of Customers	%
Hawker (n = 112)	10.2	Braiser (n = 279)	25.4
Retailer (n = 730)	66.5	Housewife (n = 688)	62.7
Wholesaler (n = 255)	23.3	Restaurant Operators (n = 130)	11.9
Total (N = 1097)	100	Total (N = 1097)	100

n: No. of traders and customers in each Category; N: Total

The distribution of chickens affected per market was 14.7% in Farcha, 10.2% in the central market, 20.8% in Champ Fil, 12% at Diguel, 11.3% at Al Afia and 31% at Dembé.

Out of 1097 chickens that were the subject of observations, females constituted 65.2% of the number as against 34.8% of males. Female chickens were most sought after by various customers who attend the markets of N'Djamena (Table 2). The braisers acquired twice as many females. The same trend was observed among housewives and restaurant operators where females were close to half the total number of chickens bought.

Table 2: Absolute frequencies of chickens purchased based on their sex according to the type of customers in the markets of N'Djamena, Chad

Chicken Sex	Type of Customer		
	Braiser	Housewife	Restaurant Operator
Male	82	254	46
Female	197	434	84
Total	279	688	130

Table 3: Variation of average weight and price of chickens in the markets of N'Djamena, Chad

Chicken Sex	Mean Weight (g)	Mean Price in F CFA*
Male (n=382)	1 130.34 ± 253.33 ^a	3282.64 ± 683.78 ^a
Female (n=715)	878.44 ± 124.36 ^b	2814.88 ± 1037.90 ^b
Total (N=1097)	966.16 ± 216.33	2977.31 ± 857.01

a, b: Means with different superscript vary significantly (P < 0.05); n: No. of traders and customers in each Category; *: One Euro = 655.987 F CFA

VARIATION OF WEIGHT AND AVERAGE PRICES BASED ON THE SEX OF CHICKENS

The average weight of the chickens at markets was 966.16 ± 216.33 g, for an average price of 2977.31 ± 857.01 CFA francs (One Euro = 655.987 CFA Francs). Males were heavier than females (p < 0.05). It was the same with average prices which varied according to the average weight (Table 3).

CHANGE IN WEIGHT OF CHICKENS ACCORDING TO SELLERS OR CUSTOMERS

The changes in average weight (Table 4) showed significant differences ($p < 0.05$), according to the categories of sellers or customers. Thus, the hawkers sold heavier chickens than those of retailers and wholesalers. Housewives acquired preferably significantly ($p < 0.05$) heavier chickens than those of restaurant operators and braisers.

Table 4: Changes in average weight of chickens according to the categories of traders and customers in the markets of N'Djamena, Chad

Trader	Mean Wight (g)
Hawker	1068.57 ± 208.53 ^a (n = 112)
Retailer	980.08 ± 225.75 ^b (n = 730)
Wholesaler	881.33 ± 155.74 ^c (n = 255)
Customer	
Braiser	838.06 ± 117,11 ^c (n = 279)
Housewife	1028.55 ± 232,01 ^a (n = 688)
Restaurant operator	910.92 ± 148,59 ^b (n = 130)

a, b, c: Means with different superscript vary significantly ($P < 0.05$); n: No. of traders and customers in each category

CHANGE IN CHICKEN PRICES ACCORDING TO SELLERS AND CUSTOMERS

Males that cost 3,282.64 ± 683.78 CFA francs were significantly ($p < 0.05$) more expensive than females (2,814.18 ± 895.20 F CFA). Between sellers and customers, some price variations were observed (Table 5). Hawkerc sold chickens at a significantly higher average price ($p < 0.05$) than other categories of traders. It was the same with customers when housewives have acquired chickens at a higher average price than restaurant operators and braisers.

Table 5: Changes in average prices of chickens according to the categories of traders and customers in the markets of N'Djamena, Chad

Trader	Mean Price in F CFA
Hawker	3406.25 ± 552.88 ^a (n = 112)
Retailer	2996.72 ± 995.44 ^b (n = 730)
Wholesaler	2733.33 ± 222.87 ^c (n = 255)
Customer	
Braiser	2698.03 ± 116.09 ^c (n = 279)
Housewife	3141.88 ± 1037.90 ^a (n = 688)
Restaurant Operator	2705.77 ± 294.43 ^b (n = 130)

a, b, c: Means with different superscript vary significantly ($P < 0.05$); n: No. of traders and customers in each Category; *: One Euro = 655.987 F CFA

The price was significantly correlated to weight ($p < 0.001$; $R = 50.8$). A variation of prices according to customers and in accordance with weight was observed (Table 6). House-

wives paid significantly much higher prices ($p < 0.05$) for chickens weighing more than one kilogram.

Table 6: Changes in average weight and price of chickens according to the customers in the markets of N'Djamena, Chad

Customer	Mean Wight (g)	Mean Price (F CFA)
Braiser (n=279)	838.06 ± 117.11 ^a	2698.03 ± 116.09 ^c
Restaurant operator (n=130)	910.92 ± 148.59 ^a	2705.77 ± 294.43 ^c
Housewife (n=688)	1028.55 ± 232.01 ^b	3141.88 ± 1037.90 ^b

a, b, c: Means with different superscript in column vary significantly ($P < 0.05$); *: One Euro = 655.987 F CFA

DISCUSSION

Although, the standard deviations are relatively high because of the destination of chickens (all conveyed to markets), the study showed a significant customers' preference according to domestic (at home) or commercial (outside home) use. Thus, housewives opted for the purchase of relatively heavy (more than one (01) kg) chickens while braisers and restaurant operators (outside home) chose lighter ones (less than one kg). Housewives acquire heavier chickens to meet the needs of the family, consisting an average of five (5) persons in N'Djamena (MEP, 2009). Thus, carving the chicken in households N'Djamena can meet the need of every family member. Among braisers and restaurant operators selling processed chicken outside home, looking for profit is a constant concern. The quest for profit leads them to acquire lighter, thus cheaper fowls. Restaurant operators usually carve chickens in part in order to sell them as cooked dish, while braisers sell the whole chicken braised. At Bongor, capital city of East Mayo Kebbi Region, housewives would also buy chickens heavier than those of braisers and restaurant operators (Mopaté and Djimé, 2012). In Bongor as well as in N'Djamena, selecting chickens per customer category is made according to processing goals. These observations confirm our assumption. According to several authors (Guèye et al., 2000; Muchadeyi et al., 2004; Aklilu et al., 2007; Teno, 2009; Eumuron et al., 2010), preference of village chickens to exotic chickens is most often related to the best organoleptic qualities of their meat. The review of the criteria for selecting chickens by customers at the markets in N'Djamena shows that it is the weight and gender of the chickens which influence much their choice rather than the price. This choice is probably guided by processing goals. The change in price according to weight on the markets has also been reported by Dana et al. (2010) and Shishay et al. (2014). They point out that the weight dictates the price. Males, which are generally heavier, have high market prices (Mailu et al., 2012).

According to sellers, the importance of female chickens

CONCLUSION

sold in different markets of N'Djamena is due to a particular preference by Muslim women for this kind of chickens. They justify this preference by its cook-ability. Indeed, their meat is tenderer, thus more appreciated than old male chickens whose meat is much harder. These old reform males are usually sold in markets. The same observations for female chickens were made in Senegal by Guèye et al. (2000) who argue that it is the hens who have just starting to lay eggs are most sought. The second explanation of the high number of females may be based on the tradition of welcoming visitors in rural households in Chad. Indeed, welcoming a guest results most often in the killing of a male chicken. Thus, many males would be self-consumed by households, therefore less available in the markets. The higher proportion of females at the markets of N'Djamena is contrary to observations made in rural markets of Senegal and Malawi (Guèye, 1998; Gondwe et al., 2005).

The change in weight of chickens by types of traders can be explained by the fact that hawkers and retailers are the wholesalers' first customers. Retailers offer preferably relatively heavy chickens (900 to 1,100 g). These two categories target customers made up of mainly housewives who prefer in most cases, larger fowls. Retailers are most often at fixed selling spots in markets, far from wholesalers. In contrast, hawkers are highly mobile, crisscrossing neighbourhoods and compounds of the districts of N'Djamena on foot, bicycle or motorbike to provide chickens to individuals, especially in households. Among wholesalers, only lighter fowls (about 880 g) would remain. Moreover, it is not excluded that wholesale suppliers who are also chicken processors keep for them less heavy subjects according to their preference. The average weight of chickens purchased by braisers was close to that of subjects sold by wholesalers. However, the average weight obtained in the present study was low in comparison to the results obtained in the same markets of 1,047 g by Issa et al. (2012b). The average weight of males ($1,130.34 \pm 253.33$ g) is almost similar to the results obtained by these authors. In contrast, the average weight of females (878.44 ± 124.36 g) remains lower than the average bracket of 1017g still observed by these authors. The average weights both overall and by gender are comparable to those observed by Mopaté and Djimé (2012) on the market of Bongor in the East Mayo Kebbi Region. This city is the 3rd supply area of N'Djamena in chickens (Issa et al., 2012b). The increase in average prices of around 2,980 CFA Francs recorded is significantly higher than the 2,660 CFA Francs average obtained by Issa et al. (2012b) a year earlier at the same markets. This increase might be due to the pressure of demand which drives up prices. It also stimulates the development of chicken production in rural areas (Guèye et al., 2000; Ahmed et al., 2012).

The study shows a significant preference of customers according to domestic (at home) or commercial (out of home) use for chickens acquired in the markets of N'Djamena. Housewives especially buy heavy fowls to meet domestic demand for chicken meat. Out-of-home chicken processing traders, braisers and restaurant operators rather prefer less heavy chickens to maximize their profit margin. Thus, according to the intended processing objectives, the weight seems to be a decisive factor in customers' choice. The lighter females were most sold in the markets. The proven existence of demand for less heavy chickens by out-of-home processors leads us to advise farmers to move more towards the production of young chickens to meet the needs of the customers.

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CONFLICT OF INTEREST

Authors declare no conflict of interests for the contents in the manuscript.

AUTHORS' CONTRIBUTION

Youssof Mopate Logtene assured project promotion, investigation design and paper drafting. Bichara Issak Haroune assured the realisation and seized the data investigation and reading paper. Ali Brahim Bechir, Madjina Tellah and Djougui Somarkamla participated in data analysis and reading of paper.

REFERENCES

- Aklilu HA, Hlmenkinders CJM, Udo HMJ, Van Der zijpp AJ (2007). Village consumption and marketing in relation to sex, religion festivals and market access. *Trop. Anim. Health Prod.* 39(3): 165-177. <http://link.springer.com/journal/11250/39/3/>.
- Ahmed MF, Nishibori M, Islam MA (2012). Production and price of indigenous naked neck and full feathered chicken reared under rural scavenging system in Bangladesh. *J. Agric. Extension Rural Develop.* 4(4): 92-97.
- Dana N, Van der Waaij LH, Dessie T, Van Arendonk JAM (2010). Production objectives and trait preferences of village poultry producers of Ethiopia: implications for designing breeding schemes utilizing indigenous chicken genetic resources. *Trop Anim. Health Prod.* 42(7): 1519-1529. <http://dx.doi.org/10.1007/s11250-010-9602-6>
- Emuron N, Magala H, Kyazze FB, Kugonza DR, Kyarisiima CC (2010). Factors influencing the trade of local chickens

- in Kampala city markets. *Livest. Res. Rural Develop.* 22 (4): www.lrrd.org/lrrd22/4/emur_22076.htm.
- Gondwe TN, Wollny CBA, Kaumbata W (2005). Marketing system and channels for scavenging local chickens in Lilongwe, Malawi. *Livest. Res. Rural Develop.* 17: 24. Retrieved from: <http://www.lrrd.org/lrrd17/3/gond17024.htm>. (Accessed on September 17, 2016).
 - Guèye EF (1998). Village eggs and fowl meat production in Africa. *World Poult. Sci. J.* 54: 73 – 86. <http://dx.doi.org/10.1079/WPS19980007>
 - Guèye EF, Dieng A, Dieng S (2000). Meat quality of indigenous and commercial chickens in Senegal. Proceedings of an International Workshop on Issues in Family Poultry Research and Development. (ed. Sonaiya EB). Pp: 146-152.
 - Issa Y, Mopaté LY, Louassouabé G, Ayssiwédé SB, Missohou A (2012a). Consommation hors foyer de poulets traditionnels dans la ville de N'Djaména (Tchad). *Revue Scientifique du Tchad (RST)*. 11 (1 spécial): 42-52.
 - Issa Y, Mopaté LY, Djougou S, Missohou A (2012b). Traditional poultry supply and marketing in the city of N'Djaména in Chad. *Int. J. Poult. Sci.* 11(5): 341-348. <http://dx.doi.org/10.3923/ijps.2012.341.348>
 - Mailu SK, Wachira MA, Munyasi JW, Nzioka M, Kibbiru SK, Mwangi DM, Kaguthi P, Kithome J (2012). Influence of prices on market participation decisions of indigenous poultry farmers in four districts of Eastern province, Kenya. *J. Agric. Soc. Res.* 12(1): 1-10. <http://www.ajol.info/index.php/jasr/article/view/81674/72340>
 - MEP (Ministère de l'Economie et du Plan) (2009). Deuxième recensement de la population et de l'habitat (RGPH2), Résultats globaux. Pp. 88.
 - Mopaté LY (2010a). Revue du secteur avicole du Tchad. Projet OSRO/CHD602/EC. Organisation des Nations Unies pour l'Alimentation et l'Agriculture (FAO), Financement Union Européenne. Pp. 72. http://www.fao-ectadbamako.org/fr/IMG/pdf/Chad_FR.pdf.
 - Mopaté LY (2010b). La filière volaille locale dans l'approvisionnement en viande des villes: cas de la ville de N'Djaména au Tchad. Actes de l'Atelier pour le Développement de l'Aviculture Professionnelle au Tchad (DAPT), du 09 au 12 juin 2009, à N'Djaména (Tchad). Ministère de l'Elevage et des Ressources Animales (MERA), International Finance Corporation (IFC) of the World Bank Group, FAO, SCAC (Ambassade de France), LRVZ. Pp. 14 – 18.
 - Mopaté LY and Djimé M (2012). Approvisionnement et transformation hors-foyer de la volaille villageoise dans la ville de Bongor, Tchad. *Revue Scientifique du Tchad*. 11(1 spécial): 63-73.
 - Mopaté LY, Ban-Bo BA, Nadjilem D, Mbairamadji F (2014). Characteristics and level of protection of the broilers and laying hens farms of N'Djaména zone (Chad). *Res. Opin. Anim. Vet. Sci.* 4(1): 5-10.
 - Muchadeyi FC, Sibanda S, Kusina NT, Kusina J, Makuza S (2004). The village chicken production system in Rushinga District of Zimbabwe. *Livest. Res. Rural Develop.* 16: 40. Retrieved from: <http://www.lrrd.org/lrrd16/6/much16040.htm>. (Accessed on September 17, 2016).
 - Olasunkanmi M, Bamiro Abiodun O, Otunaiya Adejumo I (2013). Profil efficiency in poultry production in per-urban Lagos, Nigeria. *Int. J. Appl. Agric. Apicultural Res.* 9(1-2): 120-130. <http://www.ajol.info/index.php/ijaaar/article/view/96937/86244>
 - Shishay M, Belay B, Dessie T (2014). Marketing and price determinant factors of village chicken products: The case of western zone of Tigray. *J. Biol. Agric. Healthcare.* 4 (25): 152-161. www.iiste.org
 - SPSS (2009). Statistical Package for Social Sciences, Version 17.0, SPSS Incorporated, Illinois, USA.
 - Teno G (2009). Etude des déterminants de la consommation du poulet du pays: cas de la région de Dakar (Sénégal). Thèse Méd. Vét., No. 36, EISMV, Dakar, Sénégal.