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Supply and Marketing of Local Chicken in the Town of Abeche in Eastern Chad

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Abstract: The study characterized the supply and marketing of local chicken in the markets of the city of Abeche. It involved 38 traders including 23 wholesalers retailers, 13 retailers and two hawkers selling in five poultry markets located in the 2nd, 3rd and 6th districts of the city. Traders, aged 36.21±10.9 years, are mostly Muslims (100%) of whom 52.62% schooled and 47.36% illiterate who started their activities between the 1990s and 2000s (89.47%). Wholesalers and retailers get their supply especially in the regions of Ouaddai, Wadi Fira and Sila (97.36%). As for hawkers (5.26%), they get their supply from the selling markets in Abeche. Transportation is done by trucks (50.01%), carts (34.21%) and motorcycles (32.21%). Packaging consists mostly of cages (89.5%). Of the 156 birds lost during transportation, chickens constitute 86.5% of the number and pigeons 13.5%. These losses are estimated to the amount of 395,283 FCFA. The major customers are housewives (40%), restaurant's owners and braisers at drinking spots (60%). The average selling prices are 2,926 FCFA/chicken, 2,241 FCFA per guinea fowl, 8,125 FCFA per duck and 646 FCFA/pigeon. The average gross margin on less sold ducks is higher ($p < 0.001$) than that which realized on the other species. Organizing the actors, allocating some facilities at the markets as well as improving storage and transport will allow for a better supply of local chickens in the city.

Key words: Supply, marketing, local chicken, abeche, eastern Chad

INTRODUCTION

In Sub-Saharan Africa, village chicken farming is prominent due to its socio-cultural, nutritional and especially economic role (Provost and Boredo, 1968; IEMVT, 1978; Almargot *et al.*, 1985; Grundler *et al.*, 1988; Gueye, 1998; Mopate *et al.*, 1998; Ly *et al.*, 1999).

In Chad, the study on the review of the poultry sector estimated the family poultry flock at 47.9 million birds consisting mainly (99%) of poultry in the traditional sector (Mopate, 2010a). Chickens, ducks, guinea fowls and pigeons constitute, in their order of importance, the core in this flock. In the region of Abeche, the absence of semi-industrial farming made possible the development of family poultry that is practiced by more than 90% of households and in all the agro-ecological zones of the country (Mopate, 2010a).

The population of the city of Abeche is about 160,000 inhabitants (TMEP, 2009). The city is the main urban center in Eastern Chad. In addition to natural population growth, rural-urban migration and events in the neighboring Darfur region (Sudan) have contributed to increasing its population. This growth leads to an increase in demand for food, especially of animal origin including poultry products and raises a supply problem. Moreover, the improvement of the standard of living

results in a transformation of consumption patterns. Nowadays, chicken and its by-products are more geared towards sales at markets in order to provide some income to producers (Alders, 2005).

In Abeche, there is virtually no data on the contribution of traditional poultry farming to cover the demand for meat. The objective of this study was to characterize the market supply and marketing of traditional poultry in the city of Abeche in Chad.

MATERIALS AND METHODS

Study site: The study took place in the town of Abeche in February 2014. Located in Eastern Chad, Abeche is the capital city of the Ouaddai Region. It extends between 13°48' 584" north latitude and 20°50'139" east longitude. The study area is under the influence of the intertropical climate with a dry season of 9 months and a rainy season of three months. The pattern of these two seasons is defined by fluctuations between the dry air masses from the North (harmattan) and the Southwest maritime humid air masses (monsoon). The average annual rainfall is about 300 mm. The temperature of the region varies depending on the periods. The average annual temperature in Abeche is about 28°C with a variation in the cold season (from December to

February), between 16 and 35°C and in the dry season (April and May) between 25 and 41°C.

The study area is characterized by an extensive breeding with high calf rearing potential. The number of livestock in the area is estimated at 356,900 heads of cattle, 114,000 camels, 75,400 sheep, 148,000 goats, 6,800 horses, 41,000 donkeys and 129,214 fowls (TME, 2007; Mopate, 2010a).

The population of Abeche is estimated at 160,000 inhabitants (TMEP, 2009). The urban district of Abeche includes six administrative subdivisions and 42 neighborhoods of which four are home to poultry market.

Data sampling and collection methods: A preliminary survey was conducted by visiting the various markets in the city of Abeche in order to identify the locations of poultry sales. Cages for the transport and storage of poultry by market were also counted. Data collection conducted by retrospective cross-sectional survey was exhaustive because of the small number of poultry traders (38).

The interviews with chicken traders at various markets focused on the following items:

- 1: Characteristics of traders (age, gender, ethnic group, religion, length of time in the trade, marital status, level of education, family composition, category of actors, main activity, market attendance)
- 2: Supply practices (markets attended, means of transportation used, type of packaging used, losses incurred during transport, etc.)
- 3: Marketing practices (poultry species considered, buying and selling prices, average daily sales, time spent to sell out the stock, number of collectors, dealers and hawkers, market frequency, major customers, etc.)
- 4: Poultry supply and marketing constraints
- 5: Proposals to improve the supply of the city of Abeche with chickens

Data analysis: The data were analyzed using the Statice Package for the Social Science (SPSS) software (SPSS, 2009). The information collected was synthesized in percentages and means. Variables selected after sifting were subjected to an analysis of Variance (ANOVA). The breakdown of means was made on the typical factors of traders, customers and sex of chickens sold. The meaning of the means was observed at 5% threshold.

RESULTS

Characteristics of markets and operators: The number of cages identified and the number of traders surveyed by poultry market highlighted the importance of markets Amsoudourié, Tchouri and the former livestock market in poultry marketing (Table 1).

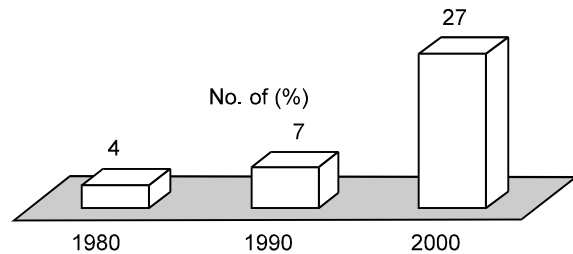


Fig. 1: Number of traders per decade of poultry sale activities in Abeche (Chad)

Poultry trade or sale is an activity practiced by both men (60.5%) and women (39.5%). The average age of 38 traders surveyed was 36.21 ± 10.9 years. According to the categories of operators, the average age has varied: it was 36.13 ± 11.35 years for 23 wholesalers retailers, 34.85 ± 11.19 years for 13 retailers and 38.0 ± 19.8 2 years for 2 hawkers. The average age difference between them was not significant ($p > 0.05$). Hawkiers were older than retailers who were relatively younger.

Married constituted 55.26% of the sample with a woman on average, 5.55 ± 4.69 children and 1.32 ± 2.28 active.

In general, the average length of service in the activity of selling poultry was 14.11 ± 8.2 years. Retailers wholesalers had more years (14.78 ± 6.6 years) of sales experience than retailers (12.73 ± 11.4 years) and hawkiers (10.1 ± 10.6 years). Differences years were significant ($p < 0.001$) between the categories of traders of whom 71.05% have started selling in the decades 2000 (Fig. 1).

All traders were of Muslim confession. At the school level, 47.36% were illiterate, 39.47% of primary level and 13.15% at secondary level. Among those 13 were educated wholesalers retailers, 6 retailers and only 1 hawkier.

Most (96%) of traders have practiced the sale of poultry throughout the year while 4% have practiced irregularly.

Poultry supply and business practices: Transportation means used consisted of trucks (50.01%), carts (34.21%) and motorcycles (15.78%). Hawkiers are pedestrians.

Apart from the hawkiers (5.3%), the vast majority (94.7%) of traders attended regional markets (Table 2).

More than half (58%) of traders are provided daily with, while 42% were once a week. The chickens were packaged for transport in cages by 89.5% of traders, against only 10.5% attached.

Hawkiers would carry the chickens in their outstretched arms for sale. Out of 156 losses incurred during transport, 86.5% were chickens and 13.5% of pigeons.

Actual stocks sold per day were made up of 1961 fowls of which 79.5% are constituted of chickens or 1,559 heads. The distribution of sales by species showed the importance of chickens in poultry sold at markets

Table 1: Distribution of the number of cages and traders in five markets selling poultry in Abeche (Chad)

District n°	Market	Neighborhood	No. of cages	No. of traders
2nd	Taradona	Taradona	12	7
3rd	Tchouri	Agad Rachid	17	9
	Amsoudourié	Amsoudourié	20	11
6th	Former cattle market	Hilé Kinine	15	8
	New cattle market	Alaziziya	3	3
Total			67	38

Table 2: Attendance (%) of regional supply markets and Abeche markets by this city poultry traders in Chad

Region and market	Number	Attendance by traders (%)
Ouaddai	26	68.4
Wadi fira and Sila	10	26.3
Tchouri market (Abeche)	2	5.3*

*Street hawkers who got their supply from Tchouri market in Abeche for sale in town

Table 3: Average buying and selling price irrespective of categories of sellers in various markets surveyed in the city of Abeche

Species	Average buying Price (FCFA)	Average selling price (FCFA)	Gross margin (FCFA)	No. of sales	No. of Sellers/species
Chicken	2,318±196	2,926±224	608	1,559	38
Guinea fowl	1,541±147	2,241±536	700	12	3
Duck	4,250±353	8,125±883	3,875	3	2
Pigeon	471±87	646±81	175	387	14

(Table 3). Means of buying and selling prices for all categories of traders reported average gross margins appreciable. The average gross margin on ducks was significantly higher ($p < 0.001$) than in other poultry species.

The cost of chicken feed, transport and daily municipal tax were estimated to an average amount of 120 FCFA per chicken. Thus, the net margin per chicken sold was 488 FCFA. Recipes daily sales traders were estimated at about 4.9 million FCFA.

For 234 chickens weighed in different markets for both sex, the average live weight was 985.7±192.6 g. Females have an average weight of 1,006.8±324.3 g which is higher ($p < 0.001$) than that of males (826.8±256.5 g). It is the same for the gender-based sale when males (75.17%) were sold more than females (24.83%) ($p < 0.001$).

The majority of retailers and all the hawkers, making up 70% of the total, took three days in average of to sell their poultry stock while it took wholesalers (30%) less than 6 days. Retailers wholesalers have an average of five suppliers each. They were assisted in the redistribution or poultry sale by two established resellers in average and one or two hawkers. As for retailers, 13 have an average of 3 suppliers, but no dealer or hawkler.

Among 40% of traders, the main customers were housewives, while among 30% of the total number, these are housewives, restaurant operators or braisers in drinking spots altogether, the remaining (30%) customers constitute a mixed group (housewives and restaurant operators).

Slaughtering at markets: Out of 1,559 chickens sold daily, 567 heads or 36.37% were slaughtered and

Table 4: Average carcass weight (g) and yields (%) of chickens sold at Abeche markets

Sex	Average carcass weight (g)	Average carcass yield (%)
Male (n = 112)	587.8±156.5 ^a	70.0±5.7 ^a
Female (n = 33)	704.8±225.3 ^b	70.0±4.8 ^a
Total (n = 145)	646.3±123.8	70.0±5.25

Averages in columns followed by different letters differ significantly at 5% threshold

plucked on site, exclusively for poultry purchased from retailers wholesalers and established retailers.

Slaughtering is done by men, who would be paid the slaughtering fees. At an average fee amount of 100 FCFA per processed poultry and for 567 heads concerned, daily income from slaughtering was about 56,700 FCFA. For 14 people who have invested in this activity, the daily income was about 4,050 FCFA.

For 145 chickens slaughtered and weighed during the survey, the average carcass weight was 690.8 g and carcass yield was 70%.

The majority of males (77.2%) had an average carcass weight lower than that of females ($p < 0.001$). About the carcass yield means, observations did not indicate significant differences by sex (Table 4).

In terms of the number of chickens sold (1,559 heads) per day, estimates of carcass meat were 1,075,694 g or about 1.1 tons/day or 396 tons/year.

Losses incurred during transport and difficulties encountered: For 38 traders, losses due to transport were estimated to average amount of 10,402 FCFA. Among the retailers, the average costs were higher than among retailers wholesalers (Table 5).

Table 5: Estimated cost (in FCFA) of poultry losses by category of traders in Abeche

Type of traders	Total loss	Average loss	Total cost	Average cost	Number
Wholesaler retailer	91	3.96	266,539	11,587	23
Retailer	44	4.93	128,744	14,425	15
Total	156	2.93	395,283	10,402	38

Table 6: Difficulties encountered by the actors in supplying the town of Abeche with poultry

Conditions	Number	Percentage
Losses related to transport conditions and distance	20	52.63
Lack of financial support	10	26.32
Lack of premise	8	21.05
Total	38	100

Table 7: Proposals made by traders to improve the supply of the town of Abeche with poultry in Chad

Conditions	Number	Percentage
Assigning a local market	15	48.39
Granting credit	9	29.03
Transport conditions and costs	5	16.13
Improving breeding	2	6.45
Total	31	100

Major concern of traders remains the allocation of a premise for sales and a credit grant for their operations

Difficulties encountered in supply were in losses of poultry during transport and the long distance from collection centers or markets (Table 6).

All traders reported having difficulties in selling poultry. The losses recorded incurred are due to packaging and transportation conditions, distance separating from the purchasing areas and difficult access to supply regions. The improvement of transport and storage conditions, the lack of financial support and premise for the sale of poultry have been the major concern of most traders (Table 7).

DISCUSSION

The study characterized the supply and marketing of local poultry at markets in the city of Abeche. Compared to the 80's and 90's, the importance of the poultry trade in Abeche is illustrated by the growing number of traders as well as the number of chickens sold daily. Thus, the number of traders has tripled within two decades from 7 in 1990 to 27 in the 2000s. Similar observations are made at the poultry markets of N'Djamena where the number of traders has increased from 151 in 2001 (Mopate, 2010b) to 220 in 2012 (Issa *et al.*, 2012).

Compared to the number of illiterate poultry traders observed in N'Djamena (63%) (Issa *et al.*, 2012), the level of education of poultry traders in Abeche (52.64%) is relatively high. This can be seen as an asset in achieving any development program with a view to organize, educate and train the actors to undertake biosecurity actions at markets.

Both men and women can be found doing the trade in Abeche. However at the markets in N'Djamena, no woman was seen doing this job (Issa *et al.*, 2012). The presence of women among poultry traders, including the

widowed and the divorced, shows that this activity gives them money to cover part of their basic needs. As such, selling poultry is considered to be a tool for promotion and gender equality (Gueye *et al.*, 2000; Traore, 2006; Seye, 2007). It was also observed that in rural areas, in addition to production management activities, women are involved in the business of selling alongside men (Alabi *et al.*, 2006; Ogunlade and Adebayo, 2009; Dinka *et al.*, 2010).

In order to ensure the supply of chickens, village collectors travel to other nearby areas. Thus, in addition to other communities in the Ouaddai region, other areas supplying chicken markets in Abeche were Wadi Fira and Sila. Distance varies from 30 to 150 km from the city of Abeche. Rural markets in these regions are places supplying chickens. These observations are consistent with those reported by several authors (Okot, 1990; Ouedraogo and Zoundi, 2001; Dessie and Ogle, 2001; Mlozi *et al.*, 2003; Gondwe *et al.*, 2005; Emuron *et al.*, 2010) in various African countries. Moreover, the study by Gondwe *et al.* (2005) in Malawi showed that traditional marketing channels of local poultry in sub-Saharan Africa are important and complex, both in terms of the importance of trade and the number of trends that characterize them. As such, wholesalers and some retailers adopt generally long commercial channels, whereby chickens are acquired far from urban consumption centers. In contrast, hawkers and some dealers choose for a shorter channel by getting their supply directly from wholesalers located at different markets in the city (Branckaert and Gueye, 1999; Mlozi *et al.*, 2003) made the same observations. Another less important poultry selling channel is also observed during the current study. It concerns rural women who come to town on donkey back to get their supply of food and cosmetic products in Abéché. Those women sometimes bring with them chickens that are sold directly to households in the streets of Abeche (door to door). It would be difficult to quantify the number of such vendors and the number of chickens sold.

In the collection regions, rural supply markets are held on a weekly basis. At such markets, poultry sale is often a one-time activity. Similar observations were also made in other areas of Africa by Gueye (2010) and Aklilu *et al.*

(2007) who noted that the poultry marketing is one of the few opportunities available to rural households to generate cash income.

Determining roles of different actors in the poultry marketing chain in Sub-Saharan Africa have been reported by several authors, namely in Uganda (Emuron *et al.*, 2010), Ethiopia (Dessie and Ogle, 2001), Tanzania (Mlozi *et al.*, 2003), Malawi (Gondwe *et al.*, 2005), Burkina Faso (Ouedraogo and Zoundi, 2001) and Senegal (Teno, 2010). Our results revealed the presence of some middlemen such as collectors or suppliers in the supply areas and retailers and hawkers in town. These observations are similar to those observed by Issa *et al.* (2012) in Chad, Emuron *et al.* (2010) in Uganda, Dessie and Ogle (2001) in Ethiopia, Mlozi *et al.* (2003) in Tanzania, Gondwe *et al.* (2005) in Malawi, Ouedraogo and Zoundi (2001) in Burkina Faso. In Abeche, actors of local poultry marketing carry out this activity full time. Thus, sales of poultry are regular throughout the year on the markets (Taradona, Tchouri, Amsoudourié and cattle markets). This is the case also observed in other markets in African cities (Gueye, 1998).

In terms of professional experience, the majority of traders (68.42%) have a relatively old experience. The concentration of sellers and cages in the 2nd, 3rd and 6th administrative subdivisions is related to the importance of markets such as Taradona, Tchouri, Amsoudourié and the former cattle market in the respective districts.

The average number of poultry sold was approximately 1,961 heads. In the absence of previous studies, it is difficult to compare this number with that of previous years. But the observed increase in the number of traders gives an indication of a development in this activity. In N'Djamena, the number of birds sold increased from 2,542 per day in 2001 (Mopate, 2010b) to 3,701 heads in 2012 (Issa *et al.*, 2012), which shows the importance of poultry in general and local chickens in particular in meeting the urban demand for poultry meat in Chad (Mopaté and Awa, 2010).

The average live weight (985.7 ± 192.6 g) is lower than that observed in the markets of N'Djamena ($1,047.1 \pm 219.9$ g). This difference would be linked to the age of the slaughtered subjects, which appears to be relatively younger, therefore less heavy because of the pressure of demand (Mopate and Djime, 2012; Issa *et al.*, 2012.). The high weight of female birds sold on the market of Abeche would suggest the output of cull hens from the backyard. Our results show that male birds are sold more than females. This can be explained by the fact that farmers tend to keep females for reproduction whereas males are intended for marketing. These observations confirm those made by Gueye (1998) in Senegal and Gondwe *et al.* (2005) in Malawi. Weight and size are the two determinants involved during the purchase at the market. The same observations were

made in Senegal by Teno (2010) who reported that weight is the most sought criterion by households and restaurants, while for sacrifices the color of feathers and sex are the most considered criteria. Unlike the poultry markets in N'Djamena (Issa *et al.*, 2012), it is indeed observed that males are sold more than females. These observations are in agreement with those reported in rural markets in Senegal (Gueye, 1998) and Malawi (Gondwe *et al.*, 2005).

Slaughtering is practiced in three of five poultry markets (Amsoudourie, Tchouri and Taradona) that do not have a poultry slaughterhouse, but it is a prepared slaughter area where customers wishing to slaughter their chicken can benefit from this service. However, chickens are slaughtered without being plucked unlike at slaughter areas in N'Djamena where chickens, once killed, are plucked and cleaned using hot water (Issa *et al.*, 2012). Thus, the coagulated blood in the hole is scraped and packed in a bag. Bags and feathers are dumped at the landfill at the end of the day. Carcass yield obtained (70%) is higher than that observed in the market of N'Djamena (65%) (Issa *et al.*, 2012) and is less than 80% reported in Burkina Faso (Kondombo, 2007) and 90% obtained in Ivory Coast (Kouadio *et al.*, 2010). This difference comes from the form in which the weighing of carcasses is presented. In our case, weighing carcasses are separated from some of their body parts such as the neck, head and the offal.

The average price of local chicken purchased in the supply areas at the time of study was higher (2,318 FCFA) than the average price observed in N'Djamena (1,870 FCFA) in 2012 (Issa *et al.*, 2012) and the national average price (1,840 FCFA) observed in 2008 (Mopaté, 2010a). This may be due to the high demand for poultry meat in general and that of chicken in particular. It should be noted that the city of Abeche has experienced an increase in its population following the events in Darfur. The presence of many non-governmental organizations with relatively high purchasing power has contributed to rising food prices. The average price is also higher than those reported in Niamey, Niger (Assoumane and Ousseini, 2010).

Conclusion: The study characterized the market supply and marketing of village chickens in the city of Abeche. The results showed that poultry selling activity is steady throughout the year. Abeche is supplied with chickens by three different regions which are sometimes relatively remote. Some problems listed by traders are major constraints of this activity. The organization of the various actors in the sector as well as supply chains could improve the supply and marketing of chickens in Abeche. In the absence of semi-industrial poultry production and in order to meet the high demand, the implementation of a comprehensive village poultry development program in high production areas is important. This study is but the beginning of a

research that deserves to be deepened and complemented by some further studies on different production systems.

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REFERENCES

- Aklilu, H.A., C.J.M. Almekinders, H.M.J. Udo and A. J. Van Der zijpp, 2007. Village poultry consumption and marketing in relation to gender, religious festivals and market access. *Trop. Anim. Health and Prod.*, 39: 165-177.
- Alabi, R.A., A.O. Esobhawan and M.B. Aruna, 2006. Econometric determination of the contribution of the family poultry to the women's income in the Niger-Delta, Nigeria. *J. Central Eur. Agric.*, 7: 753-760.
- Alders, R., 2005. L'aviculture: source de profit et de plaisir. Brochure de la FAO sur la diversification, Rome: FAO, 3.
- Almargot, J., M. Aklilu et and G. Fosseha, 1985. Pathologie aviaire en Ethiopie, examen de 198 necropsies effectuées en 1983-1984 a la Faculte de Medecine de Debre-Zeit. *Revue d'Elevage et de Medecine Veterinaire des pays Tropicaux*, 38: 130-137.
- Assoumane, I. et G. Ousséini, 2010. Revue du secteur avicole du Niger. <http://www.fao.org/docup/012/ak770f/ak770f00.pdf>. 61 p (05 aout 2010).
- Branckaert, R.D.S. and E.F. Gueye, 1999. FAO's programme for support to family poultry production. In *Poultry as a Tool in poverty Eradication and Promotion of Gender Equality-Proceedings of a Workshop*. <http://www.husdyr.kvl.dk/html/php/tune99/24-Branckaert.htm>.
- Dessie, T. and B. Ogle, 2001. Village poultry production systems in the Central Highlands of Ethiopia. *Trop. Anim. Health and Prod.*, 33: 521-537.
- Dinka, A.M., R. Chala, F. Daw, S. Leta and E. Bekana, 2010. Socio-economic importance and management of village chicken production in rift valley of Oromia, Ethiopia. *Livestock Res. Rural Dev.*, 22. www.lrrd.org/lrrd22/11/dink22203.htm.
- Emuron, N., H. Magala, F.B. Kyazze, D.R. Kugonza and C.C. Kyarisiima, 2010. factors influencing the trade of local chickens in Kampala city markets. *Livestock Research for Rural Development*. Volume 22 (4), Article #76. Retrieved May 7, 2011, from <http://www.lrrd.org/lrrd22/4/emur22076.htm>.
- Gondwe, N., B.C.A. Wollny and W.T. Kaumbata, 2005. Marketing system and channels for scavenging local chickens in Lilongwe, Malawi. *Livest. Res. Rural Dev.*, 17: 3.
- Grundler, G., M. Schmidt and K. Djabakon, 1988. Serologie de la maladie de Newcastle en milieu tropical. *Fiches techniques d'élevage tropical*. Fiche n°1.
- Gueye, E.F., 1998. Poultry plays an important role in African village life, *Word Poul.*, 14: 14-17.
- Gueye, E.F., 2000. The role of family poultry in poverty alleviation, food security and the promotion of gender equality in rural Africa *Outlook on Agric.*, 29: 129-136.
- Gueye, E.F., A. Dieng and S. Dieng, 2000. Meat quality of indigenous and commercial chickens in Senegal. *Proceedings of an International Workshop on Issues in Family Poultry Research and Development (Sonaiya E.B., Ed.)*, pp: 146-152.
- Gueye, E.F., 2010. Filiere avicole dans le monde, en Afrique et au Tchad. Actes de l'Atelier, pour le Developpement de l'Aviculture Professionnelle au Tchad (DAPT), du 09 au 12 juin 2009, a N'Djamena (Tchad), Grimaud P. et Mathieu L. (Ed.). *Ministere de l'Elevage et des Ressources Animales (MERA), International Finance Corporation (IFC) of the World Bank Group, FAO, Service de Cooperation et d'Action Culturelle (SCAC) de l'Ambassade de France, Laboratoire de Recherche Veterinaires et Zootechniques (LRVZ)*, p: 9-13.
- I.E.M.V.T., 1978. Situation actuelle et possibilité de développement de l'aviculture en République du Tchad. *Laboratoire de Farcha, N'Djaména (Tchad). Rapport de mission*, 106 p.
- Issa, Y., L.Y. Mopate, S. Djougui and A. Missohou, 2012. Traditional poultry supply and marketing in the city of N'Djamena in Chad. *Int. J. Poul. Sci.*, 11: 341-348.
- Kouadio, K.E., B.J. Kouao, G.S. Kouadja, A. Fantoji and A.Y.L. Yapi, 2010. Influence du systeme delevage sur les caracteristiques des carcasses des poulets locaux (*Gallus gallus domesticus*) en region forestiere humide de Cote d'Ivoire. *Int. J. Biol. Chem. Sci.*, 4: 2294-2301.
- Ly, C., S. Savane, M.T. Seck and A. Faye, 1999. L'aviculture rurale au sud du Sénégal. *Cahiers Agric.*, 8: 123-125.
- Mlozi, M.R.S., A.V.M. Kakengi, U.M. Minga, A.M. Mtambo and J.E. Olsen, 2003. Marketing of free rang local chickens in Morogoro and Kilosa urban markets, Tanzania. *Livest. Res. Rural Develop.*, 15 p.
- Mopate, L.Y., 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*. 72 p: http://www.fao-ectad-bamako.org/fr/IMG/pdf/Chad_FR_.pdf.

- Mopate, L.Y., 2010b. La filiere volaille locale dans l'approvisionnement en viande des villes: cas de la ville de N'Djaména au Tchad. Atelier pour le Développement de l'Aviculture Professionnelle au Tchad (DAPT), du 09 au 12 juin 2009, a 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, p: 14-18.
- Mopate, L.Y. and N.D. Awa, 2010. Systemes avicoles en zone de savanes d'Afrique centrale : performances zootechniques et importance socio-economique. L. SEINY-BOUKAR, P. BOUMARD (editeurs scientifiques), 2010. Actes du colloque International, intitulé 'Savanes africaines en développement: innover pour durer,' 20-23 avril 2009, Garoua, Cameroun. PRASAC, N'Djaména, Tchad ; CIRAD, Montpellier, France, mise en ligne sur <http://hal.cirad.fr/cirad-00472067/fr/>, ou disponible sur CD, 11 p.
- Mopate, L.Y., P. Hendrikx, M. Imadine and A. Idriss, 1998. Socio-economie de la production aviaire dans la region du Nord-Guéra au centre du Tchad. *Revue Sci. du Tchad*, 5: 29-32.
- Mopate, L.Y. and M. Djime, 2012. Approvisionnement et transformation hors-foyer de la volaille villageoise dans la ville de Bongor, Tchad. *Revue Sci. du Tchad (RST)*, 11: 63-73.
- Ouedraogo, S. and S. Zoundi, 2001. Approvisionnement de la ville de Ouagadougou en poulets de chair. *Int. Develop. Res. Centre*, 15 p. Accès Internet http://www.idrc.ca/en/ev-33703-201-1-DO_TOPIC.htm.
- Okot, M.W., 1990. A co-operative Approaches to smallholder Rural Poultry Production in Uganda. In: *Smallholder Rural Poultry Production. Proceedings of a CTA Seminar, Thessaloniki, Greece, October, 9-13*, pp: 249-253.
- Ogunlade, I. and S.A. Adebayo, 2009. Socio-economic status of women in rural poultry production in selected areas of Kwara State, Nigeria. *Int. J. Poult. Sci.*, 8: 55-59.
- Provost, A. and C. Boredo, 1968. Utilisation en Afrique Centrale d'un vaccin aviaire polyvalent. *Revue Elevage Med. Vet. des Pays Tropicaux*, 21: 165-179.
- Seye, E.M., 2007. Evaluation d'un transfert de paquet technique en aviculture familiale et de son impact sur la generation de revenus et l'egalite du genre. These: Med. Vet. Dakar, 12.
- SPSS, 2009. *Statistical Package for Social Sciences. Version 10.0*, SPSS Incorporated, Illinois, USA.
- Teno, G., 2010. Analyse du système de commercialisation du poulet du pays dans le département de Dakar (Senegal). Mem: Master: Dakar, 3. EISMV.
- T.M.E (Tchad. Ministère de l'Elevage), 2007. Plan national de développement de l'élevage. N'Djaména: Ministère de l'Elevage: 62 p.
- T.M.E.P (Tchad. Ministère de l'Economie et du Plan), 2009. Institut National de la Statistique, des Etudes Economiques et Demographiques (INSEED). Deuxieme Recensement General de la Population et de l'Habitat (RGPH2, 2009), 88 p.
- Traore, E.H., 2006. Première évaluation de la structure et de l'importance du secteur avicole commercial et familial en Afrique de l'Ouest. Rome: FAO., 52 p.