Trade in Indigenous Chickens and its Profitability in Eastern Chad

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The objective of this study is to characterize the trade in indigenous chickens and its profitability in Eastern Chad. The study was conducted as a one time survey among 57 stakeholders whose 36 in Abeche city and 21 in Am-Timan city and focused on actor profiles, chicken supply sources, purchase and sale prices, various fees, prospects and constraints. Data were analyzed using XL-STAT pro software (6.1.9). Results showed that the majority of the actors were males aged at 34, married and mostly uneducated. Among player categories identified, retailers were the most represented. Purchase and sale prices varied according to the categories of actors and these prices were low for intermediaries and higher for women selling slaughtered chickens in both cities. However, these prices were low in Am-Timan than in Abeche city. The sale price was in Abeche city, but the lowest was recorded in Am-Timan city. The monthly net profit was CFA 434,566. The indigenous chicken trade is a profitable activity and income varies according to the actor categories and localities. A survey of farmers will provide information on the indigenous chicken production system in order to redirect them towards sustained productivity in line with market needs.

Keywords: Indigenous Chicken, Trade, Actor, Income, Chad.

INTRODUCTION

In sub-Saharan Africa, traditional poultry farming represents an important part of rural economy (Sonaiya and Swan, 2004). According to Gueye et al. (1998) 85% of it is practiced by households and in 70% of cases, women are homeowners. In most developing countries, poultry farming occupies a prominent place in development and poverty reduction strategies because of its short-cycle species, easier production, lower investment and accessible to all (Sonaiya and Swan, 2004 ; Bisimwa et al., 2019). In Chad, the poultry population estimated at 47.8 million heads is mainly composed of family poultry, which is raised by 90% of the population (MEPA, 2015). Since advent of oil exploitation in 2003, urban growth and relative improvement in workers’ incomes have led to a strong demand for animal protein, particularly in poultry meat. In response to this growing demand, chickens’ commercial transactions are intensifying with supply chains, sales methods and means of transport established for each urban centre. These transactions remain the basis for the supply of poultry meat and egg to urban centres (Ba, 2006 ; Mopate et al., 2016; Tellah et al., 2016). Studies on trade in some Chadian cities (Bongor, Moundou, Kélo and NDjamena) have identified actors, supply chains, different chicken prices, chicken transport means and difficulties (Mopate, 2010 ; Issa et al., 2012 ; Issa et al., 2014). However, in the cities of Abeche and Am-Timan, study of the poultry marketing system was not carried out. Hence the interest of this study is to characterize the trade of indigenous chickens and its profitability in the cities of Abeche and Am-Timan in Chad.

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MATERIAL AND METHODS

Study Areas

The city of Abeche is the capital of Ouaddaï province. It extends from 13° 48'58"N latitude to 20° 50'13"E longitude. This study area is under the influence of the intertropical climate with 9 months of dry season (October to June) and 3 months of rainy season (July to September). The pattern of these two seasons is defined by fluctuations between the dry northern air masses (harmattan) and the moist maritime air masses of the southwest (monsoon). The average annual rainfall is about 300 mm. The temperature of the region varies according to the periods. The average annual temperature in Abeche is about 28°C with a variation in the cold season (December to February) between 16 and 35°C and in the dry season (April and May) between 25 and 41°C. This city has six boroughs for a total of 46 districts. According to the latest population census, it has a population of 1, 048,962 (RGPH2). Am-Timan city is the capital of Salamat province, located in southeast Chad, between latitude 11°01'46" North and longitude 20°16'57" East. The climate is Sudanian in nature, characterized by relatively high humidity with a rainy season that extends from May to September, exceeding 800 mm of rain per year; and a dry season that extends from October to April. It is crossed by two seasonal rivers, the Barh-Azoum and the Barh Salamat, which enclave the city for part of year. The population of Am-Timan city is estimated at 38,261. According to the population of the two cities, the chicken trade is the most developed in Abeche city which have the numerous chicken traders.

Data Recording and Analysis

The study was conducted as a one time survey among 57 stakeholders whose 36 in Abeche city and 21 in Am-Timan city. Considering the low level of trade in chickens in both cities (very limited number of actors) in relation to the evolution level of each of these cities, almost all the actors were concerned by the study unless those not consenting. Data collection took place from 23 March to 15 April 2019 for Abeche city and from 03 to 12 May 2019 for frequencies and Am-Timan city. The information sought was: socio-professional profile of actors (sex, age, level of education, marital status and duration in activity) and sale activities (place of supply, method of chicken acquisitions, means of transport, mortality rate, purchase price, sale price, different costs and taxes, etc.). The data collected were analysed using XLSTAT software (6.1.9). The dependent variables were those related to socio-professional profile of actors and sale activities, and the independent variables were those related to actor categories and cities. The descriptive analysis determined the dispersion parameters (mean ± standard deviation, extremes and the analysis of variance (ANOVA) for multiple comparisons of means was performed with Newman-Keuls test (SNK) at 5% threshold. The profit margin was obtained from the difference between selling price and cost price (purchase price + costs). The costs were made up of transport costs, food costs, security costs and municipal collection tax. The net profit was analysed according to actor categories and cities.

RESULTS

Profile of Actors

The trade in indigenous chicken in this study areas was conducted mainly by men (75.44%) and to a lesser extent (24.66%) by women. These proportions varied by city (Table 1).

Table 1: Distribution of Actors by Gender in Cities of Abeche and Am-Timan

<table>
<thead>
<tr>
<th>Gender</th>
<th>Abeche (%)</th>
<th>Am-Timan (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>39.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Male</td>
<td>61.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

The average of actor ages was 34 years. Depending on the city, it did not vary significantly between Abeche city and Am-Timan city. Most of them were married (Table 2) with higher proportion among those met in Am-Timan city. For both cities, married actors were significantly more likely to be married than single, divorced and widowed (p ≤ 0.05). In both cities, the uneducated were the majority, followed in decreasing order by those at the primary and secondary educational levels (Figure 1). A small proportion of higher levels were recorded only in Abeche city.

Table 2: Distribution of Actors by Marital Status

<table>
<thead>
<tr>
<th>City</th>
<th>Single</th>
<th>Divorced</th>
<th>Married</th>
<th>Widow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abeche</td>
<td>13.89a</td>
<td>8.33a</td>
<td>75.00a</td>
<td>2.78a</td>
</tr>
<tr>
<td>Am-Timan</td>
<td>9.52b</td>
<td>0.00b</td>
<td>90.48b</td>
<td>0.00b</td>
</tr>
</tbody>
</table>

a, b: Means with different superscript vary significantly between variables ; p ≤ 0.05.

Figure 1: Distribution of Actors by Educational Level

The actor experiences, in terms of the activity duration, was studied according to categories and cities of exercise (Table 2).
Retailers were the most experienced, followed in descending order by wholesaler-retailers and wholesalers. The women selling slaughtered chickens were the least experienced (\(p \leq 0.05\)), the actors met in Abeche city were the most experienced without significant differences (\(p \geq 0.05\)).

**Category of Actors**

Six categories of actors have been identified in the chicken supply and marketing chain in cities of Abeche and Am Timan (Figure 2).

![Category of Actors](image)

**Figure 2:** Distribution of Actors According to their Categories in the Cities of Abeche and Am-Timan. *The different letters between the bars of the same variable indicate a significant difference (\(p \leq 0.05\)).*

In both cities the actors were: retailers (the highest in Abeche city and lowest in Am-Timan city), wholesalers, collectors and sellers of slaughtered chickens (categories not represented in Am-Timan city and intermediaries in Abeche city), and wholesalers - retailers the highest in Am-Timan city and the lowest in Abeche city (\(p \leq 0.05\)).

**Supply, Daily Sales and Transport**

The average number of chickens collected per stakeholder was 52.09 ± 48.15 chickens per supply. By city the average was 29.05 ± 8.46 chickens in Am-Timan city and 65.53 ± 56.26 chickens in Abeche city. The difference in the number of employees collected between cities was significant (\(p \leq 0.05\)). Following the average losses recorded (3.25 ± 0.46 head), the average sale was 48.90 ± 45.71 chickens and varied according to the categories of actors and cities (Table 3).

The number of chickens sold was higher for wholesalers than other categories and higher in Abeche city than in Am-Timan city (\(p \leq 0.05\)).

The means of transport (Figure 3) used by the actors were: vehicles (74.51%) and motorcycles (25.49%).

**Table 3: Average Daily sale of Chickens according to Cities**

<table>
<thead>
<tr>
<th>Category of Actor</th>
<th>Mean ± SD</th>
<th>Abeche</th>
<th>Am-Timan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector</td>
<td>53.75 ± 26.15(^a)</td>
<td>51.75(^a)</td>
<td>-</td>
</tr>
<tr>
<td>Retailer</td>
<td>44.10 ± 1.00(^a)</td>
<td>43.56(^a)</td>
<td>30.00(^a)</td>
</tr>
<tr>
<td>Wholesaler-Retailer</td>
<td>30 ± 19(^a)</td>
<td>35.00(^a)</td>
<td>26.50(^a)</td>
</tr>
<tr>
<td>Intermediate</td>
<td>20 ± 33.83(^a)</td>
<td>-</td>
<td>19.00(^a)</td>
</tr>
<tr>
<td>Women Selling Slaughtered Chickens</td>
<td>20.5 ± 26.15(^b)</td>
<td>20.00(^b)</td>
<td>-</td>
</tr>
<tr>
<td>Wholesaler</td>
<td>133.3 ± 23.08(^c)</td>
<td>125.11(^c)</td>
<td>-</td>
</tr>
<tr>
<td>General Mean</td>
<td>48.90 ± 45.71</td>
<td>62.00 ± 26.48</td>
<td>53.16 ± 8.15</td>
</tr>
</tbody>
</table>

\(a, b, c\): Means with different superscript vary significantly between categories in the cities; \(p \leq 0.05\).

**Figure 3:** Vehicle Transport of Chickens from Retailers Operating at the Market of Abeche City

**Expenses Related to the Activity**

The costs were made up of: transportation, food, municipal taxes and market gardening for chickens. It was CFA Francs 83.80 ± 50.70 per chicken.

**Income Analysis of Indigenous Chicken Traders**

The average purchase price was CFA francs 1,998 ± 113 and varied according to trader categories and cities (Table 4). The purchase price was higher among the sellers of slaughtered chickens and lower among intermediaries. For cities, the purchase price was higher in Abeche than in Am-Timan (\(p \leq 0.05\)).

The average selling price was CFA Francs 2,380 ± 101 and varied according to the categories of actors and cities (Table 5).

The selling price was highest among the sellers of slaughtered chickens and lowest among intermediaries.
For the cities, the selling price was higher in Abeche city and lower in Am-Timan city (p ≤ 0.05). The average daily profit was CFA francs 13,433 ± 6,101 or CFA francs 212,047 ± 120,816 per month and varied according to the categories of actors (Table 6).

**DISCUSSION**

**Profile of Actors**

The actors were 75% men and 25% women in Abeche city against 100% of men in Am-Timan city. The presence of women in this activity in Abeche city is particularly limited to the sale of slaughtered chickens. This result is similar to the observations made in Dakar (Mbouga, 2011) and in NDjaména by Mopate (2010), where they reported that the indigenous chicken marketing activity is mainly carried out by men. In contrast, Aklilu et al. (2007) and Dinka et al. (2010) in Ethiopia, Emuron et al. (2010) in Uganda and Sodjinou (2011) in Benin reported different results indicating that activity of selling poultry at markets is dominated by women. The practice of activity according to gender would be culturally related. This is why the actor genders vary from one country to another. The actors are all mostly uneducated, married for the most part and relatively young with an average age of 34 years. On the academic level, the uneducated were the most numerous with ¾ in Am-Timan city and more than ¾ in Abeche city. This result is higher than that reported in NDjamëna city by Mopate (2010). On the religious level, all Muslim actors were justified by the predominance of Islam in these two cities. The actor ages was slightly younger but not very different from that reported by Mopate (2010).

**Experience of Actors**

Retailers have been more experienced in the business than other categories of actors. This study reported the presence of women selling chickens slaughtered in Abeche city, whereas this actor categories does not exist in Am-Timan city. The presence of women selling chickens slaughtered in Abeche city is new compared to the list of actor categories reported by other studies on chicken marketing system in Chad (Mopate and Djimet, 2012 ; Issa et al., 2014; Mopate et al., 2016). The sale of indigenous chicken carcasses on the market would be driven by demand from new urban consumers who do not have enough time to slaughter and process live chickens. As far as the locality is concerned, this activity is older in Abeche city than in Am-Timan city. The more populated city of Abeche borders the province of Darfur in Sudan. It is home to several national and international NGOs involved in refugee assistance. This characteristic explains the practice of selling carcass chickens and even the differences in the prices charged.

In this study, the means used to transport chickens was mostly vehicles (74.45%). These observations are in agreement with those reported by other authors (Emuron et al., 2010 and Mopate and Djimet, 2012) that actors use appropriate means of transport when supply routes move away from sales outlets. This is why, in Borgor in southern Chad (Mopate and Djimet, 2012), depending on the distance between the supply points and market, 50% of traders used motorcycle, 23% bicycle, 12% vehicle and...
The difference in transport modes between localities is explained by the fact that in sub-Saharan Africa, there are no specialized means of transporting indigenous chickens (Byarugaba, 2007). However, this transport mode varies according to proximity of village market and available means of transport (Moustier, 1999). The precarious storage conditions during the transport lead to mortality losses. Wholesalers were the most exposed to this risk than other categories because of the higher number of chickens acquired.

**Analysis of Actor Income in the Indigenous Chickens Trade**

The purchase price varied according to actor categories and localities. The purchase price was higher for the sellers of slaughtered chickens (CFA francs 2,687 ± 119.16) than for the intermediaries (CFA francs 1,250 ± 154). This price was lower in Am-Timan city (CFAF 1,501) than in Abeche city (CFA Francs 2,320 ± 92.51). The selling price was higher among the sellers of slaughtered chickens than at retailer. The chicken in Am-Timan city goes to consumers at CFA Francs 1.951 ± 78.1 while in Abeche the chicken was sold at CFA Francs 2.700. The latter price was not very different from CFA francs 2,814 reported in N'Djamena City (Mopate et al., 2016) but slightly lower than the price reported in the same city of CFA francs 2,926 (Issa et al., 2014). The difference in chicken selling prices between Abeche and Am-Timan cities was CFA Francs 749 and could be explained by the extension of sales chain in Abeche city than Am-Timan city. This result corroborates the observations of Williams et al. (2006) who reported that the involvement of many intermediaries in trade of indigenous chickens increases costs and risks in marketing process. Indeed, each intermediary tries to make a profit at his level. A chicken sold by the farmer at low price (CFA Francs 2,050 ± 119.6) was resold by an intermediary to consumer at higher price (CFAF 2,707 ± 78.1), representing a price difference of CFA Francs 657. As marketing channel expands, selling price increases. At each level of circuit, actor seeks his profit. The monthly net profit in Abeche city was CFA francs 334,018 compared to CFA francs 175,168 in Am-Timan city. This profit was CFA francs 434,566 for retailer compared to CFA francs 271,220 for wholesaler. Despite some difficulties cited by the stakeholders (diseases, under-selling, transport mortality and poor road quality) that have resulted in loss of few chickens, the activity is profitable.

**CONCLUSIONS**

The trade in indigenous chicken in Chad, is not only a source of income for the actors but also contributes to the population's food security. The majority of activity was carried out by men, both married and uneducated. Actor categories were identified (collectors, retailers, wholesalers, wholesalerretailers, intermediaries and carcass sellers). Purchase, sale and net profit prices varied according to actor categories and the locality. The average monthly net profit was substantial and much higher for retailers and for Abeche city. Therefore, the trade in indigenous chickens in the cities of Abeche and Am-Timan is a profitable activity. A better organization of trade and a complementary study on the indigenous chicken production system would be necessary in order to redirect them towards sustained productivity in line with market needs and to better valorize this activity.

**REFERENCES**


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