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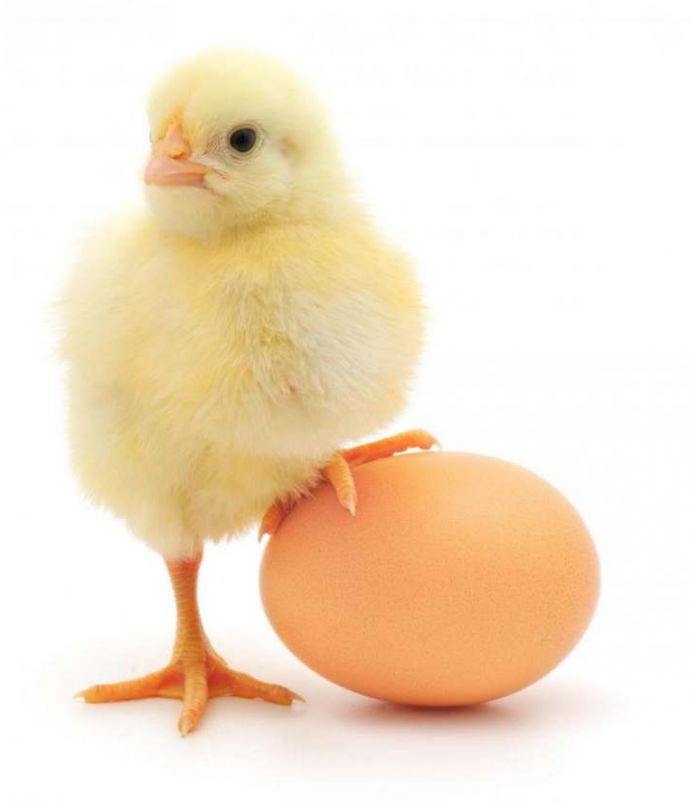

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Production Practices, Constraints and Performance in Traditional Chicken Breeding in Chad

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Abstract: The objective of this work was to characterize the production of chickens and technical performance of family poultry farms in the Departments of Hadjer Lamis in the Sahel zone and West Tandjilé in the Sudanian zone. The crosscutting and retrospective survey covered 16 villages and 233 farmers randomly selected. The investigated Livestock was made up of 5208 birds. Poultry farmers are mainly farmers (86.7%), with an average age of 40.7 ± 14.9 years practice poultry farming as a secondary activity. They are mostly men (71.2%), illiterate (51.5%) and especially married (91.8%). The majority of men (70.4%) reported being owners of the poultry yards. Dominant types of henhouses are huts (45.1%) and rudimentary livestock structures (35.5%). Feed distributed to poultry are mainly cereals (77.7%) served on the ground (60.9%), 2 times a day by 96.6% of poultry farmers. Drinking water is served in old utensils (47.2%), broken jars or pottery (39.1%) and wooden containers (13.7%). Medical prophylaxis is non-existent; farmers make use of traditional care in case of bird disease. Newcastle disease and predation are the main causes of mortality in chicken breeding. The size of the poultry yards is 16.8 ± 19.9 chickens for a hens / rooster sex ratio of about 2.0. The age at first egg is 5.6 ± 1.31 months. The number of broods per annum is 3.57 ± 0.92, with 11.56 ± 2.23 eggs / egg-laying. The average hatching rate is about 87% and chick survival to weaning 74%. Production is mainly destined for sale (87.6%). With 22.68 ± 11.32 individuals sold per annum at an average price of 2270 FCFA per chicken, earnings are 51.529 CFA/annum per producer. The average number of chickens consumed is 6.99 ± 7.65 heads per annum. Decisions to sell chickens are made especially by men (60.5%), but only women have ensured the sale at the markets. No significant difference was observed between the two Departments at the socio-economic level and reproductive parameters of the birds, probably due to the similarity of practices implemented.

Key words: Family poultry farming, chickens, production practices, performances, Chad

INTRODUCTION

In most developing countries, about 20% of the protein consumed comes from domestic poultry and traditional chicken breeding contributes for 70% of poultry production (Alders, 2005). It is characterized by the breeding of reduced numbers made up of several species of local breed (chicken, guinea fowl, duck and pigeon), reared in extensive mode (CIRAD (Centre Internationale en Recherche Agronomique pour le Développement), 2006).

Despite the remarkable development of the industrial poultry farming in recent years in sub-Saharan Africa, in Chad, the village chicken still represents 99% of the national poultry flock estimated at 47.9 million heads in 2010 (Mopaté, 2010).

Practiced by almost all farmers, especially women and children in rural areas, family poultry farming is an important food and socio-economic pillar for rural families (Agbede *et al*., 1995; Missohou *et al*., 2002; Aboe *et al*., 2006; Bebay, 2006; Traore, 2006).

In addition to food and health stress, as well as those related to livestock management and climatic conditions, traditional poultry farming is characterized by a lower productiveness than that of exotic breeds (Abdou and Bell, 1992; Bonfoh *et al*., 1997; Hofman, 2000; Tadelle and Ogle, 2001; Sonaiya and Swan, 2004; Pousga, 2005).

The improvement of productivity in family poultry farming necessarily requires knowledge of practices and constraints of chicken breeding in production areas. Thus, the present study has set for itself the objectives of the characterization of chicken production and economic and zootechnics performances of the breeding.

MATERIALS AND METHODS

Selection and presentation of the survey areas: The choice of the study areas is justified by the fact that the survey of traditional chicken breeding in various markets

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of the city N'Djamena (Mopaté, 2010; Issa *et al*., 2012) identified two main areas of production of village chickens, namely:

- The Department of Hadjer Lamis in the sahelian zone, with Massakory as capital city. It is located at 150 km north of the city of N'Djamena. Its GPS (Global Positioning System) location is 9°18 'North latitude and 15°48' East longitude
- The Department of West Tandjilé in the sudanian region, the capital city of which is Kelo at 365 km away from N'Djamena. The city of Kélo is located at 12°59' North latitude and 15°44' East longitude

Data sampling and collection: The study was carried out during the months of April and May 2012. The survey was conducted in 16 villages selected at random and divided into two production areas (9 in the Sahel and 7 in the Sudanian zone). A total of 233 poultry farmers were surveyed, being 10% of producers.
The questionnaire developed after bibliographic and resource persons' consultations were pre-tested with a small sample of producers to improve its consistency. The data collected included:

- socio-economic characteristics of traditional poultry farmers (gender, age, ethnic group, region of origin, religion, level of education, marital status, family composition)
- Production practices (composition of farmyards, objectives, habitat, diet, health management, marketing)
- Animal performance (reproductive parameters) and socio-economic parameters (sales, consumption, etc.)

Data analysis: The data collected were entered in Excel and the various parameters were processed using the Statistical Package for the Social Sciences (SPSS) software. The information collected was synthesized in terms of their percentage and average with standard deviations. The variables selected after flat sorting were subjected to analysis of variance (ANOVA) with multiple comparison test of Newman-Keuls. The significance level chosen on the mean differences was 5%.

RESULTS

Characteristics of the breeders: Farmers have an average age of 40.7±14.9 years with a minimum of 15 years and a maximum of 80 years. They are in majority men, illiterate and mostly heads of households of Muslim, Christian or animist faith. Almost all are married having 1.25±0.6 wives, with families of 5.74±3.9 children and 3.87±1.4 assets. The majority is made up of agro-pastoralists without any non-core activities (Table 1). Chickens belong to men (70.4%), women (27.5%) and children (2.1%). The main objective of the breeding is that is dome for sale (87.6%), for sale, consumption and hosting guests at the same time (9.4%) and only for hosting guests (3.0%).

Table 1: Socio-economic profile of traditional poultry producers in Chad

Character	No.	(%)
Status		
Head of household	181	77.7
Other	52	22.3
Gender		
Male	166	71.2
Female	67	28.8
Religion		
Muslim	118	50.6
Christian	108	46.4
Animist	7	3.0
Level of education		
Illiterate	120	51.5
Primary	67	28.8
Secondary	45	19.3
University	1	0.4
Marital status		
Married	214	91.8
Other	19	8.2
Main activities		
Agro-breeder	202	86.7
Other	31	13.3
Non-core activities		
No	147	62.7
Yes	87	37.3

Managing the poultry breeding: Composition of the poultry-yards: In total 5208 birds are identified out of which 3829 chickens representing 73.5% of the number, 693 guineas (13.3%), 454 ducks (8.7%) and 232 pigeons (4.5%). The average size of poultry yards per household is 16.8 birds. The overall makeup of chicken flock is made up of 9.7 chicks, 4.58 adult females and 2.52 adult males (Table 2). Raising chickens is associated with that of other animals, particularly small ruminants and cattle with an average of 11.58 and 5.5 per household, respectively.

Accommodation in poultry-yard: Poultry breeders house their fowls in small huts (Fig. 1) or within a summary building made of local materials (Fig. 2) where, in most cases, the separation of chickens per batch does not exist. The henhouses are built by men, children and women and are considered to be the egg-laying spots by 52% of poultry breeders (Table 3). The results in Table 3 indicate that the surveillance and cleaning of the house the barn are carried out by men and women. In all the poultry farms visited (100%), the birds do not have nest boxes for spawning.

Food in the poultry-yard: All poultry breeders distribute some food to chickens. The rate is essentially on a daily basis with an average of 2 times. As for the types of food, 80% used cereals (millet, sorghum, maize and rice) and food waste (Table 4). Stakeholders in food distribution

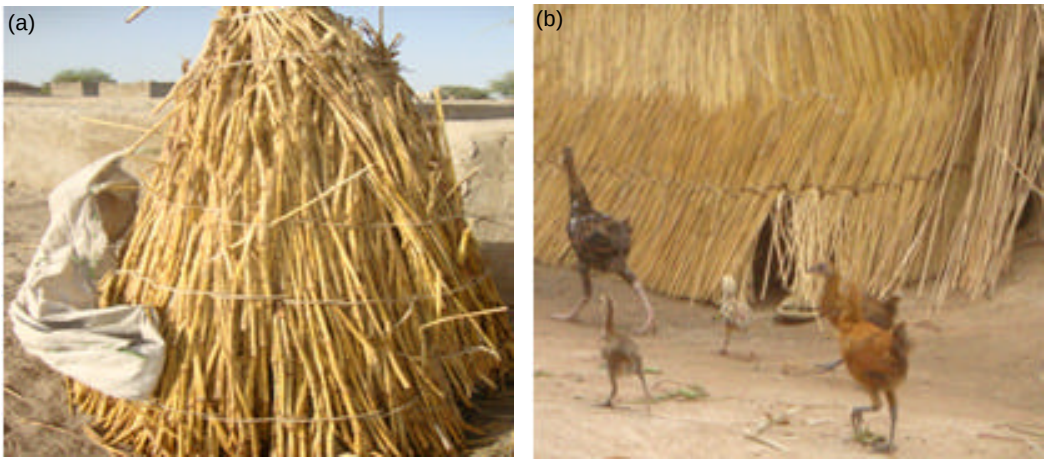

Fig. 1(a-b): Coops in small huts

are men, women and children. Food is mostly distributed on the ground and drinking water served in old utensils, pieces of broken pots or jars and wooden containers.

Health management

Chick mortality: The chick mortality rate before weaning was 25.6%. The main causes are diseases and predators (cats, birds of prey). This mortality is more pronounced during the dry season than the cold season (Table 5).

On the other hand, mortality was 29.8%. The deaths were mainly attributed to diseases (43.3%), predation alone (2.6%) or both (45.5%). Chickens are reformed at an average age of 36.45 months due to decreased production (58.4%) and onset of disease (10.7%). The rest (30.9%) of farmers has no clear criteria for reforming birds.

The described symptoms (diarrhea, respiratory and nervous disorders, loss of appetite, prostration), periods of occurrence and the losses incurred suggest the presence of the Newcastle disease which is the disease most encountered in about 65% of poultry farms. The rate of onset of disease was highest in December and January than in March and April. As for treatment against the Newcastle disease, approximately 79% of poultry farmers use more traditional treatments, by using medicinal plants. In order to fight against other avian diseases, most of them use deworming medicines, antibiotics and other products meant for human use (Table 6).

Performances of reproduction: Reproductive parameters show an average age of egg-laying onset at about six months, a production rate of about four spawnings in a year and a hatching rate of 87% (Table 7).

The ratio of the average number of weaned chicks (7.41 heads) to the average number of hatched chicks (9.96 subjects) gives a chick survival percentage of approximately 74%.

Marketing and consumption: Almost all farmers sell their chickens. Decisions for the sale of chickens are made especially by men followed by women and children. The average sales price in the Sahel region is 2428±324.7 FCFA and 2112±391.7 CFA francs in the sudanian region giving an overall average of 2270±1568.9 CFA. Based on an average sale of 22.68±11.32 chickens per year, the average revenue per producer amounts to 51, 529 CFA francs. Sale at markets is done by women, children or a family member. The chickens are sold throughout the year (100%) at market places in the nearest town, in the village or at markets in neighboring villages. Customers are applicant customers-buyers and collectors (Table 8).

Most breeders keep a portion of chicken for self consumption. The average number of chicken consumed is 6.99±7.65. The chickens are consumed during foreigners' visits, fieldwork, celebrations or ritual sacrifices (100%). In general, the rate of consumption is accidental and depends on circumstances (100%). On the other hand, almost all producers surveyed (97%) said they did not sell or eat eggs because they prefer keeping them for incubation. Only a small minority (3%) of adults and youths reported consuming eggs despite the absence of taboos associated with consumption of eggs in the areas covered by the survey.

DISCUSSION

The results of this study show that poultry farming is practiced by men in Chad. The same observations are made in Niger (Prost, 1987; Moussa *et al*., 2010). Where

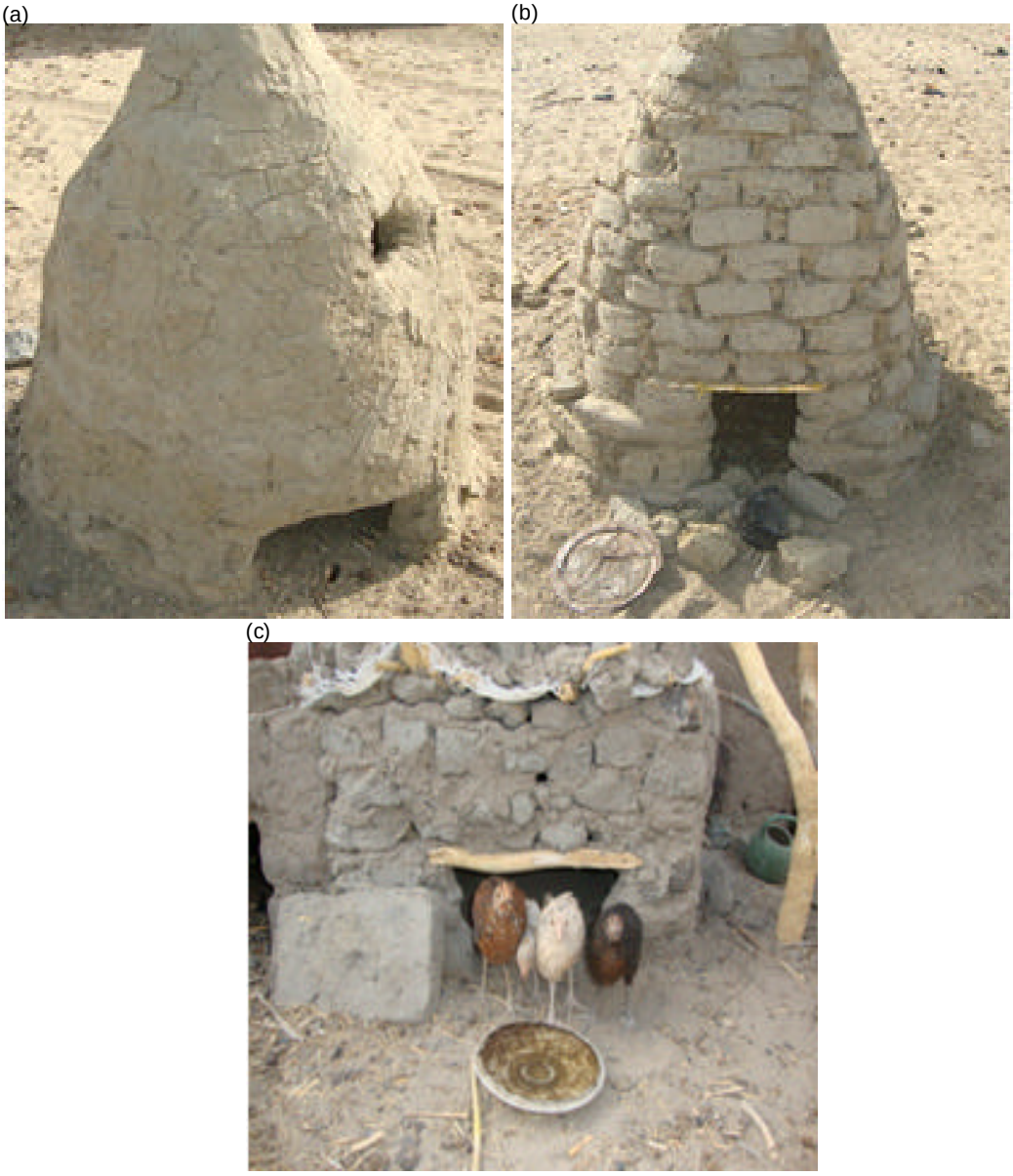

Fig. 2(a-c): Coops made of non-durable materials

men dominate in 78 and 84.5%, respectively of cases. However, in Cameroon (Agbede *et al*., 1995), Morocco (Benabdeljalil, 2002), Gambia (Bonfoh *et al*., 1997) and Senegal (Missohou *et al*., 2002), this production is mainly in the hands of women. However, the prevalence of men in the practice of poultry farming could be based due to the almost systematic ownership of the woman's poultry by her husband (Moussa *et al*., 2010), who considers that he owns every property in its compound yard. It could also be due to the fact that men are the first to show up during the conduct of investigations.

The composition of the surveyed poultry stock was similar to observations made by Mopaté and Idriss (2002) who reported that the village traditional farming include in order of importance chickens, ducks, guinea fowls and pigeons and some geese the breeding of which has a very timid start. However, the importance of the main types of poultry varies depending on ecological zones (Mopaté and Idriss, 2002). The average size of backyard flocks (16.8 birds) in the current study is close to the observations by Mopaté and Lony (1999) in suburban areas of N'Djamena (16.3 birds), Sana (1997) in the Sub- Prefecture of Bongor (17.6 heads) but is higher (12 heads) than the data given by Mopate and Maho (2005) in southern Chad. In the northern part of Chad, Mopaté *et al*. (1999) observed larger numbers of

Table 2: Average structure of poultry yard in traditional breeding in chad

Characters	Species	Variables	Average	SD	Min.	Max.
Composition of poultry yard	Chicken	Male	2.52	±3.48	0	26
		Female	4.58	±5.25	0	36
		Chicks under the mother	9.70	±13.16	0	145
	Duck	Male	0.45	±3.37	0	50
		Female	1.09	±5.45	0	80
		Ducklings with mother	0.42	±4.66	0	70
	Guinea fowl	Male	0.79	±4.04	0	55
		Female	1.94	±5.15	0	38
		Young guinea fowls under the mother	0.24	±2.32	0	27
	Pigeon	Male	0.20	±1.32	0	17
		Female	0.64	±3.72	0	47
		Young pigeons under the mother	0.16	±1.17	0	10
Ownership structure of the herd	No. belonging to:	Man	15.12	±30.83	0	396
		Female	2.38	±5.79	0	35
		Children	0.71	±2.89	0	21
		Parents	0.30	±1.93	0	18
Other animals raised	No.	Cattle	5.50	±9.00	0	50
		Sheep	2.38	±7.58	0	95
		Goat	9.20	±11.93	0	86
		Pork	0.38	±1.56	0	16
		Other (Horse, Donkey)	0.17	±0.98	0	6

SD: Standard deviation, M: Minimum, M: Maximum

26.8 heads in Biltine, 24.3 subjects in the Ouaddai region and 26.6 birds in Guera region. Compared with the results obtained elsewhere in Africa, the size of the poultry stock is greater than that observed by Agbede *et al*. (1995) in Cameroon (11.2 heads in the West, 13.5 in the North and 12.7 birds in the East) but is less than the number of 22.7 subjects reported by Missohou *et al*. (2002) in Senegal.

Our results on poultry coops encountered and the nature of the construction materials used in this study are consistent with those reported by Ndélédjé (2000) in Senegal, Bonfoh *et al*. (1997) in The Gambia and Aganga *et al*. (2000) in Botswana, according to whom the coops are made from either brick or locally available materials with a thatched or iron sheet roof. These are small huts or summary buildings made of local materials where access is difficult in most cases and separation of chicken lots does not exist. Feeders are non-existent or made of old utensils and mats while drinking troughs, of various kinds, are made of pieces of broken water jugs and jars or wooden containers. As for the nests, they are nonexistent. No breeder makes provision for a nest for egg-laying, unlike the results from Cameroon where breeders prepare a special corner for egg-laying (Agbede *et al*., 1995).

In addition, our observations showed that building chicken coops is carried out by men and children while for maintenance and hygiene of the coops, men rather associate with women to perform this task. However, in the Gambia (Bonfoh *et al*., 1997) and Senegal (Missohou *et al*., 2002), labor devoted to the conduct of the family poultry farming is provided by women and children. The omnipresence of men in coop construction and maintenance could be explained by the status of head of household conferred on them.

For food, chickens get in almost all farms in average twice daily dietary intake, consisting of kitchen waste and cereal grains. This is in line with the results obtained in Niger (Moussa *et al*., 2010; Prost, 1987) where 99% of farmers distribute some daily supplements to poultry in the form of cereal grains. The same observations were made in the Sahelian and Sudanian zones of Chad (Mopate and Maho, 2005; Mopaté *et al*., 2010). For the amount of food distributed by each breeder, it was difficult to estimate it during the investigation since it depends on the time of year but also oncereal availability in the operation.

The survival rate of chicks obtained in our results which is 74%, is higher than the observations made by Mapate and Maho (2005) in southern Chad, where they obtained a survival rate of chicks of 60% at the age of two months. This difference could be explained by the fact that most hatchings have occurred during the cold season. Concerning chick mortality, the rate of 26% obtained is identical to the observations made by Khalafalla *et al*. (2002) in the Sudan (25%), Mopaté and Lony (1999) in Chad (26%) but is well below the results of studies conducted by Kugonza *et al*. (2008) in Uganda (73%); Missohou *et al*. (2002) in Senegal (51%) and Badubi *et al*. (2006) in Botswana (61%).

As for chicks, the main causes of death are diseases and predators (wild and domestic cats, birds of prey, etc.) which would appear in both dry and cold seasons. In fact, the young are more prone to diseases and climatic hazards than adults. These causes have also been identified in the Sudanian region of Chad (Mopate and Maho, 2005). Among adults, disease and predators were also discussed. About the nature of predators, our results were similar to results of studies carried out in the Gambia (Bonfoh *et al*., 1997) and Burkina Faso (Iyawa, 1988).

Table 3: Coops and their management in family poultry in Chad

Character	No.	Percentage
Status		
Type of coop		
Small hut	105	45.1
Summary building	85	35.5
Room, box, kitchen	26	11.2
Without facility	4	1.7
Compartmentalization of coops		
No	149	63.9
Yes	84	36.1
Stakeholders in building chicken coops		
Male	115	49.4
Children	61	26.2
Female	15	6.4
Without oversight	42	18.0
People involved in monitoring the coop		
Male	92	39.5
Female	57	24.5
Female + child	31	13.3
Children	11	4.7
Without oversight	42	18.0
Egg-laying spot		
Henhouse	121	51.9
All around	55	23.6
Kitchen	31	13.3
Corner of the courtyard	26	11.2

Table 4: Feeding traditional poultry farming in Chad

Character	No.	Percentage
Status		
Rate of distribution		
Daily	225	96.6
Irregular	8	3.4
Types of feed distributed		
Grains (millet, sorghum, maize, rice)	181	77.7
Food waste	28	12.0
Brans	24	10.3
People involved in the distribution of poultry feed		
Male	86	37.8
Female	76	32.6
Children	16	6.9
Woman+children	16	6.9
Man+Woman	13	5.6
Man+Woman+child	24	10.3
Distribution types		
On the ground or soil	142	60.9
Containers (old utensils, mats)	91	39.1
Nature of watering place		
Old utensils	110	47.2
Broken jar or pot	91	39.1
Wooden container (canoe)	32	13.7

Table 5: Causes of chick mortality in family poultry farming in Chad

Character	No.	Percentage
Status		
Causes of chick mortality		
Diseases	113	48. 5
Predation (wild cat, rat, fox, birds of prey)	75	32.2
Predation+disease	45	19.3
Period of chick mortality		
Dry season	112	48.1
Cold season	94	40.3
Any season	27	11.6

Table 6: Health Management in traditional poultry farming in Chad

Character	No.	Percentage
Diseases encountered		
Newcastle	151	64.8
Undefined	82	35.2
Period of disease onset		
Cold season (December-January)	102	43.8
Dry season (March-April-May)	92	39.5
Any season	39	16.7
Rate of occurrence of diseases		
High mortality	201	83.3
Average mortality	27	11.6
Low mortality	5	2.1
Medical prophylaxis		
No	196	84.1
Yes	37	15.9
Type of prophylaxis		
No prophylaxis	196	84.1
Immunization	32	13.7
Deworming	5	2 .1
Regularly observed symptoms		
Whitish, greenish, yellowish, diarrhea loss of appetite	76	32.6
Respiratory disorders (flow, cough)	28	12.0
Prostration, drooping wings, ruffled feathers	9	3.9
Undefined symptoms	120	51.5
Types of drugs used		
Deworming drugs, antibiotics, nivaquine for humans	161	69.1
Antibiotic products	17	7.3
Deworming products	5	2.1
None	50	21.5
Use of medicinal plants		
Yes	183	78.5
No	50	21.5
Types of medicinal plants used		
Pepper+onion+salt	67	28.8
Neem, mahogany, eucalyptus, tamarind, palmyra leaves	55	23.6
Roots and bark of plants	36	15.5
Wild cucumber	23	9.9
Donkey droppings	2	0.9
None	50	21.5
Target of medicinal plants		
Newcastle	151	64.8
All diseases	32	13.7

The observed symptoms (diarrhea, respiratory and nervous disorders, loss of appetite, prostration) described by breeders, suggest that it would be Newcastle disease which is considered the main cause of death of local chickens in villages. Our observations showed that the majority of breeders do not use medical prophylaxis. These findings have been reported in Senegal (Buldgen *et al*., 1992), in Cameroon (Agbede *et al*., 1995) and in the Gambia (Bonfoh *et al*., 1997). However, some drugs for human use such as pesticides, antibiotics and antimalarial drugs are used. Other farmers practice traditional herbal care (pepper, onion, neem and mahogany tree leaves) and plant roots and barks. These practices are consistent with the observations made in Cameroon (Agbede *et al*., 1995) and in the Gambia (Bonfoh *et al*., 1997).

Reproductive performance was quite acceptable considering the implemented production practices. The age of first production of hens being 24±1.3 weeks, was similar to that obtained by Kassambara (1989) in Mali; Khalafalla *et al*. (2002) in the Sudan, Mwalusanya *et al*.

Table 7: Performances of reproduction in traditional poultry farming in Chad

Variables	Means	Standard deviation	Min.	Max.
Age at egg-laying onset (months)	5.60	±1.31	4	8
No. of eggs per brooding	11.56	±2.23	6	20
No. of broods per year	3.57	±0.92	2	6
No. of chicks hatched	9.96	±2.21	6	17
Hatching rate (%)	86.90	±14.95	60	100
No. of chicks weaned (abandonment by hen)	7.41	±2.46	1	17
Chick mortality rate before weaning (%)	25.60	±19.58	0	100

Table 8: Marketing and consumption of village chickens in Chad

Character	No.	Percentage
Status		
Sale of chickens		
Yes	229	98.3
No	4	1.7
Responsible for the decision to sell		
Male	141	60.5
Female	62	26.6
Man+Woman+child	22	9.4
Child	8	3.4
Responsible for sales		
Women	122	52.4
Children	49	21.0
Head of household	48	20.6
Family members	14	6.0
Point of sale		
Markets of the nearest city	104	44.6
Village	68	29.2
Markets in neighboring villages	56	24.0
Markets in the capital city	5	2.1
Customer		
Applicant customer-buyer	186	79.8
Collector	44	18.9
Customer	3	1.3

(2002) in Tanzania and Moussa *et al.* (2010) in Niger. However, some authors have reported an age of egg-laying onset ranging between 28 and 36 weeks in the Sudan (Wilson, 1979), Tanzania (Katule and Mgheni, 1990) and Ethiopia (Sonaiya and Swan, 2004). This difference may be related to the race being used, to environmental conditions and farming practices in these countries (Mourad *et al.*, 1997).

Our results about the average number of eggs per brood were higher than the observations made elsewhere in Africa, by less than 11 eggs per brood in the Sudan (Wilson, 1979), in Mali (Kassambara, 1989), in Burkina Faso (Yameogo, 2003), in Senegal (Bulge *et al.*, 1992; Missohou *et al.*, 2002), in Guinea (Mourad *et al.*, 1997), in Chad (Mopate and Lony, 1999) and in Tanzania (Mwalusanya *et al.*, 2002). In contrast, the average number of eggs per hen varies between 12-19 eggs in Cameroon (Fotsa, 2008), in Congo (Fulbert *et al.*, 2004), in Botswana (Aganga *et al.*, 2000), in Tanzania (Kitalyi and Mayer, 1998), in Burkina Faso (Bourzat and Saunders, 1990), in Ethiopia (Tadelle and Olge, 2001; Halima, 2007; Mammo *et al.*, 2008) and in Uganda (Kugonza *et al.*, 2008).

The average number of broods per annum is in the range of 2-4 broods from February to April in Mali (Kassambara, 1989), in Tanzania (Kitalyi and Mayer, 1998), in Ghana (Van Veluw, 1987) and in Ethiopia (and Tadelle Olge, 2001). On the other hand, in Uganda (Kugonza *et al.*, 2008), in Guinea (Mourad *et al.*, 1997), in Senegal (Buldgen *et al.*, 1992), in Ethiopia (Tadelle and Olge, 2001; Mammo *et al.*, 2008), in Niger (Moussa *et al.*, 2010), in Cameroon (Fotsa, 2008) and in Sudan (Wilson, 1979), there are between 3.5 and 4.5 broods per year.

The hatching rate (86.9%) obtained is consistent with the observations made in many African countries which showed values over 80%. This is the case in Uganda (Kugonza *et al.*, 2008.); in Senegal (Buldgen *et al.*, 1992); in Ethiopia (Tadele and Olge, 2001 Mammo *et al.*, 2008.); in Niger (Moussa *et al.*, 2010), in Cameroon (Fotsa, 2008) and in Tanzania (Mwalusanya *et al.*, 2002).

Among the majority of farmers (98.3%), chicken is sent to closest city market to the village by the women. Men are the main decision makers on sales. Our results (22.68 heads) on the average number of annual chicken sales per breeder are superior to observations made about 20 heads by Mopaté *et al.* (1998) in Bitkine. The high market attendance of traders in the two areas surveyed was the cause of this difference. The results of studies conducted in the 1990s (Mopaté and Idriss, 2002) indicate an annual average of about 13 chickens sold in the Sahel as against six sales in southern Chad. Our observations, of about 23 chickens sold per year, indicate an increase in the sale of chickens in rural households. With this number of chickens sold at an average price of 2, 370 CFA francs per chicken, the incomes generated are around 53, 799 CFA per producer. According to the results reported by Aklilu *et al.* (2007) and Gueye (2009), poultry marketing of is one of the few opportunities for rural households to generate cash income, namely the landless and other animals such as small ruminants and/or cattle.

In terms of the consumption of poultry products, there is no taboo associated with the consumption of eggs. However, eggs are neither sold nor consumed but rather kept for flock renewal. These results confirm the observations made in Senegal by Missohou *et al.* (2002), according to whom all farmers interviewed prefer keeppin the eggs for hatching. On the other hand, in Cameroon, 30% of eggs are taken either for sale or for consumption (Agbede *et al.*, 1995).

The average number of chicken consumed is 6.99 which is relatively low compared to the 10 consumed in southern Chad (Mopaté and Idriss, 2002). This decrease in average consumption shows that the

primary objective of producing chickens is for sale. These results are consistent with the observations by Mopaté (2010) on the more speculative basis of family poultry farming in rural households. In other words, the improvement of the production is a slot that needs to be backed in the fight against recurrent poverty in rural areas.

Conclusion: It appears from this study that poultry farming in Chad remains dominated by family farming which is practiced extensively by men and is primarily intended for sale. Practices of village chicken production in the two agro-ecological zones under study are similar. The income generated from the sale of birds allows farmers to meet part of their needs. The major constraints identified, namely disease and predation-related misconduct of farms (habitat and ridiculous diet, lack of adequate health care) were those identified in several regions of Chad and Africa. These characteristic constraints of traditional poultry farming indicate that improved farming practices would reduce the losses significantly and would increase the availability of chickens exploitable by producers. Although relatively average, the zootechnical and socio-economic performances observed were close to the results of studies conducted in other parts of Chad. The socio-economic importance of the family poultry farming through annual sales and consumption highlight the interest of the development of this sector to improve the income of farmers.

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