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RESEARCH OPINIONS IN ANIMAL & VETERINARY SCIENCES

Characteristics and level of protection of the broilers and laying hens farms of NDjamena zone (Chad)

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Abstract

The objective of the study was to characterize the broilers and laying hens farms and to evaluate their protection level in order to formulate interventions strategy. The transversal and retrospective survey was carried out and about 32 out of 40 farmers at NDjamena are concerned. The average age of the farmers was 39.09±11.56 years and 81% were the birds of family of average six people. All were educated at the primary level (26%), the secondary (44%) and high school (40%). The majority (63%) practiced poultry farming as first activity and 75% created their own farm during 2000 including 63% of them between year 2005 and 2009. The age with the first laying was estimated at 148.42±18.64 days and that of reform of 19.60±3.70 months. Regarding protection, only 11 farms ensured a medical and zootechnical follow up and 16 were correctly equipped their personnel with protective cloths (blouse), boots, gloves and mask. Strengthening of the farmers' capacities in protection and technical management is a priority. Moreover, the chick availability and accessibility in veterinary products, food and materials of breeding are major concerns of the farmers to be taken into account in interventions.

Keywords: Poultry farming; Commercial farms; production; protection; NDjamena; Chad

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Introduction

Agriculture and animal husbandry constitute the major sectors of Chad economy on which it must build development strategies for poverty reduction. In the field of the breeding, poultry falls in line with the activities of reducing the food insecurity.

The family poultry contributes significantly to the supply of village chickens are urban centers (Mopaté, 2010). The semi-industrial poultry sector is struggling to stand out in the production of broilers and table eggs mostly imported from Cameroon (Mopaté et al., 2009).

According to the Second Census of Population and Housing (SCPH2), NDjamena has an estimated population of 993492 inhabitants (Ministry of Economy and Plan -MEP, 2009). Most of the commercial poultry farms (85%) in Chad are located around and in the NDjamena city. Production of these farms satisfies only 2% of egg consumption of the city dwellers (Mopaté et al., 2009). Moreover, in the context of prevention of avian influenza, the program established by the Chadian government has received financial support from the European Union through the avian influenza project, led by FAO. Given these observations, it appeared necessary to have information on the situation of poultry farms in order to guide actions. Thus, the purpose of the study was to characterize the poultry farms of NDjamena area and assess their level of protection to formulate measures for improvement.

Materials and Methods

Study site

The study was conducted in urban and suburban areas of NDjamena, capital city of Chad. Geographic coordinates of the city, taken from Global Positioning

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System (GPS) is 12°11'30''556 North latitude and 15°04'91'' 667 East longitudes. The city has a Sahel-Sudanian dry tropical climate, tropical with a long dry season (November to May) and a short rainy season (June to October), both well marked. Precipitations during at an average were 584 mm (minimum. = 226 mm and maximum = 990 mm). Maximum temperature (40-45°C) is reached in April or May. They gradually decrease during the rainy season to reach minimum in three months (December, January and February), the coolest period of the year.

Sampling and methods of data collecting

The data was collected in 32 poultry farms present in NDjamena and its periphery in a radius of 25 km. Retrospective and cross-sectional survey was conducted among managers of these units and observations on farm infrastructure have been made. Parameters collected included the following:

- Farmers' characteristics (age, sex, religion, marital status, family responsibilities, assets, main activities, year established farms)
- Production characteristics (location, type of poultry farm, strains and their origin, production parameters of broilers and eggs for consumption and marketing)
- Infrastructure (farm buildings, construction materials) and state protection in terms of sanitary and zootechnical control, availability of footbaths, fencing farms, water sources and equipment (boots, gowns, gloves, masks) of the workers. Data of protection relating to hygiene in the production were apprehended in former studies (Ban-bo, 2009).
- Production constraints

Statistical analysis

The collected data was analyzed with SPSS (version 17). Descriptive statistics were used.

Results

Characteristics of farmers

The average age of farmers was 39.09±11.56 years. 84% were young (37.48±11.71 years). Majority of farmers were married (81%) with an average 5.93±3.53 dependents. The number of average assets was 2.00±0.88. All of them are educated with levels ranging from primary (16%), secondary (44%) and higher (40 %). Officials were mostly Christians (72%), Muslim (25%) and Animist (3%). In the plan of the principal activities, 63% practiced poultry farming as first activity and others (37%) are civil servant, workers or traders. Farmers mostly set up their operations (75%) in the decade 2000, 19% in the decade 1990 and 6% in the decade 1980.

Characteristics of the production

The farms are located mostly in urban areas (84%) and the rest (16%) in suburban areas of the city of NDjamena in a radius of 25 km (Table 2). They are specialized in broilers (31%) or in egg production (31%) and the rest (38%) produced both broilers and eggs laying hens.

The average number of broiler chickens in 15 farms was 993. Nine farms had average 1367 and six had average 433 chickens. The broiler breeds "Vedette" and "Hybro" imported especially from France were dominant. These farms produced an average of 2.55±0.69 flocks per year. The specialized farms produced 2.78 ± 0.44 flocks and those mixed 2.36 ± 0.81 flocks. The average production of broilers was 59.75±7.86 days in all farms. Specialized farms have 58.89±10.24 days and those mixed have 60.41±5.68 days. They took an average of 33.20±13.77 days to sell the whole band. Per farm, the average sale was of 2269 birds in 2008, at the average price of 5,000 F CFA per unit or 2,800 F CFA per kg.

About egg production, the number of layers declared in 17 farms was of 26,281 having average 1,546 birds. In nine farms which were specialized in layer, the average number was 1941 and eight were mixed farms, the average number of birds was 101. The Leghorn breed especially from France was dominant in the farms. Age at first spawning reported by farmers at an average was 148.42±18.64 days and the reform of layers of 19.60±3.70 months. Reform average age of the hens was 17 months among farmers who have established their farm in the decade 1990 and 20

Table 1: Characteristics of farmers in NDjamena zone (Chad)

Characteristics of farmers	Values
Average age of farmers	39.09 ± 11.56 (n = 32)
Men	37.48 ± 11.71 (n = 27)
Women	47.80 ± 5.72 (n = 5)
Farmers married	81 %
Number of average dependents	5.93 ± 3.53
Number of average assets	2.00 ± 0.88
Education level	
Primary	16%
Secondary	44%
higher	40%
Religion	
Christians	72%
Muslims	25%
Animists	03%
Principal activities	
Poultry farmers	63%
Civil servant, workers or traders	37%
Decade of creation	
Decade 2000	75%
Decade 1990	19%
Decade 1980	06%

n = number of farmers concerned

Table 2: Characteristics of production in NDjamena zone (CHAD)

Characteristics of production	Values
Located of farms	
Urban area	84%
Suburban	16%
Type of farms	
Broilers	31%
Layers hen	31%
Mixed	38%
Source of food in farms	
Bought at CPBD*	45%
Mixtures at the CPBD	36%
Manufactured their own food	19%
Broiler production	
Average number of broilers	
All (15) farms	993
Specialized (9) farms	1,367
Mixed (6) farms	433
Average days production and sell	
All broilers farms	59.75±7.86
Specialized farms	58.89±10.24
Mixed farms	60.41±5.68
Days to sell whole group	33.20±13.77
Average production (flocks)	
in all farms/year	2.55 ± 0.69
in specialized/year	2.78 ± 0.44
in mixed/year	2.36 ± 0.81
Average sell and price	
Sale in bird	2, 269
Price (F CFA) per unit	5,000*
Price (F CFA) per kg	2,800
Eggs production	
Average number of layers hen	
In all (17) farms	1,546
In 9 specialized farms	1,941
In 08 mixed farms	1,101
Average age (days) of first spawning	148.42±18.64
Average age (month) removing layers	19.60±3.70
Number of layer removed (reform)	6,840
Average price (F CFA) per unit	1,905
Eggs in 06 farms agreed to declare	788,800
Average price (F CFA) of egg in farm	75
Average price (F CFA) in ultimate consumer	100
Profit recorded (F CFA) in 06 farms	59,160, 000
Margin (F CFA) of traders	3,944,000

* CPBD = Cooperative of the Professionals for the Breeding Development; *01 $ US = 500 F CFA

months for those in the decade 2000. Altogether 6840 layers were reformed in 2008, at the average price of 1 905 F CFA the unit. For 6 farmers who agreed to report the number of eggs collected in 2008, the total amounted to 788800 units. The average price of egg in the farm was 75 F CFA and that paid by the ultimate consumer of 100 F CFA. These farms recorded gross revenues of the order of 59160000 F CFA and margin of traders was 3944000 F CFA. The majority of the poultry farms (94%) did not have points of sale of their products in the city. More than half of managers (53%) surveyed said reaching satisfy demand from their customers, in terms of availability in poultry products (broilers and/or eggs). Others (47%) did not produce enough to satisfy their customers.

In 45% of farms, food has been bought at the Cooperative of the Professionals for the Breeding Development (CPBD), 36% assured mixing of food and 19% manufactured their own food at the farm.

Table 3: Characteristics of farms infrastructure in NDjamena zone (CHAD)

Characteristics of farms infrastructure	Values
Farms buildings	
Listed	81
Average number per farm	2.53
Sustainable materials	75%
Unsustainable material	25%
Crawlspace	54%
Occupied	46%
Surface of farms building	
All surface of building (sq. m.)	12,735
Average surface (sq.m.)	398
Surface in urban area (sq.m.)	279
Surface in suburban area (sq.m.)	1,040
Number of employees in farms	
Average in all	2.22 ± 1.72
Average in broilers	2.00±1.41
Average in layers	2.80±2.20
Average in mixed	1.92±1.51[a]

Infrastructure and protection level of farms

Characteristics of infrastructure are shown in Table 3. The majority (75%) of farms were built with sustainable materials against 25% with unsustainable materials. The number of buildings listed regardless of the type of material was 81 units. More than half of buildings (54%) were crawlspace against 46% occupied. The total area of the buildings was 12,735 square meter (sq. m) averaging about 398 sq. assuming five chickens per square meter. Thus total area can accommodate 63,675 birds. Average number of employee in the NDjamena area was 2.22±1.72. It ranged from 2.00±1.41 individuals in farms producing broilers, 1.92±1.51 in mixed farms and 2.80±2.20 in layers farms.

The nature of the support farms and the equipment staff showed that 11 farms out of 26 (42%) received all the support and 16 out of 24 (67%) farms have well equipped staff (Table 4). The average losses in laying and broiler farms on the basis of origin of feed are given in Table 5.

Discussion

The study highlighted the difficult conditions of production faced by the broilers and laying hens' farms in urban and suburban of NDjamena. The Results are certainly interesting because related to poultry practices

Table 4: Nature of technical support to farm in equipment and personnel in NDjamena zone (Chad)

Type of support	Farm	%	Equipment Staff	Farm	%
Sanitary	4	15.4	Blouse	3	12.5
Control, egg +mortality	2	8	Boots	2	8
Control growth + mortality	5	19.2	Blouse + boots	3	12.5
Control egg+growth+mortality	4	15. 4	Blouse + boots + gloves + mask	16	67
Support all cities	11	42	-	-	-
Total concerned	26	100		24	100

The water sources at the farm level were drilling (56 %), water supply facilities (25 %) and traditional wells (19 %).

Table 5: Average (mean ± SE) losses estimated in laying and broiler farms according to the origin of the foods used

Feed origin	Laying farm	Broiler farm
CPBD	254.2±110.8	57.5±28.7
Made in the farm	360.6±122.9	166,3±107.9
Mixed in the CPBD	404.8±133.4	266.1±127.2
Total	33 8.7±122.4	157.3±81.5

dominated by less qualified and professional production. Moreover, the study is the first attempt to characterize the commercial poultry production area of NDjamena. Nevertheless, the results on the product's technical performance of farms limit the scope of the study could be further strengthened by a longitudinal survey (ongoing data collection of farm production).

Characteristics of farmers have been close to the Islands of Taraba State in Nigeria where the average age of farmers is between 21 and 40 years (Zarhaddeen et al., 2010). Overall, the production environment including high cost of food and veterinary inputs, lack of availability of hatcheries and breeding equipment elements are implicated. The lack of professional poultry practices contribute to the losses recorded in the farms. Lack of quality feed supply, improper housing facility and lack of technical knowledge were some most important constraints perceived by the poultry farmers of Dzongue area in India (Nath et al., 2012). The high standard deviation of the averages would explain the disparity or heterogeneity of losses recorded between farms. Layer farms, the losses are observed is in the range 20 to 30% previously reported in some farms in NDjamena area (Dayon, 2000). Maho and Ndobale (1997) reported mortalities of 7% of the farms in the same area, due to tampering on layers without prior administration of anti-stress. In Cameroun, losses from 15 to 25% in the industrial breeding of layers are considered to be acceptable (Teleu Ngandeu and Ngantchou, 2006). Our results for broilers were three times higher than those from Cameroon which are between 3 and 5%. This lack of control of practices of intensive breeding of the producers has been responsible for the low level of bio-security and the least performances observed in the majority of the farms. Thus, the average length production of broilers obtained is longer compared to the average of 42-50 days reported in Cameroon (Teleu Ngandeu and Ngantchou, 2006). Beyond this time, farmers produce at a loss as feed costs are not offset by selling price of broilers. In addition, it was found that the duration of investigations selling flocks is also too long, compared to the average of 14 days observed in the savannas of the Central African Republic and northern Cameroon (Mopaté and Awa, 2010). These practices are due the ignorance of the technical management of commercial poultry farms resulting in financial losses related to food costs and working time. The average life of 19 months hens is acceptable. It is 18 months in Cameroon (Teleu Ngandeu and Ngantchou, 2006). These authors reported that chickens are still laying eggs after 20 months of life with a rate of lay 60% acceptable. The average age of reform hens from our observations is higher than that observed in the savannah zone of Cameroon, the Central African Republic and Chad in Central Africa about 18 months (Mopaté and Awa, 2010).

The least growth performances which determine the lengthening time of production could come from inadequate food formulas, which involve delays of broilers growth. Food formulas are underway in the feed mill CPBD are based mainly on those established since the time of the National Society of Animal Production (NASOAP). They knew certainly some modifications but the readjustment of the energy levels according to seasons is not practiced at the feed mill. Commercial feed mill in major African countries producers of chickens and eggs (Cameroon, Burkina Faso, Senegal, Cote d'Ivoire, Nigeria, etc.) this energy level readjustment according to the seasons is the rule. The fact that more than half of the farmers does not buy food with CPBD, would translate either a lack of confidence in the quality of food manufactured or of the high costs practiced by this feed mill.

Production of broilers is still very modest, because the total production in 2008 remains below the annual average of 16, 000 birds obtained in eight years (1970 - 1977) production farms in NDjamena (Institute of Livestock and Veterinary Medicine of the Tropical countries -ILVMT, 1978). In 2001, about 10,500 birds have been used in NDjamena providing 24.3 tones meat carcass (Mopaté, 2010). As for eggs consumption, the annual average of a million eggs obtained between 1970 and 1977 (ILVMT, 1978) in NDjamena farms could be exceeded if the collect on production data was reliable. Our results have been obtained in six farms

only who accepted to declare their production in 2008. These elements highlight difficulties in the collection of statistical data on poultry products in Chad. They also indicate the need for active participation of producers in the production of statistical data. The estimation made in 2001 for NDjamena indicated an annual consumption of approximately 19 million eggs (Mopaté and Idriss, 2002; Mopaté et al., 2009), from where an average of annual consumption of 27 eggs per person at NDjamena. This need is essentially satisfied by the importation of eggs production from southern Cameroon.

Broilers as hens evolve throughout their lives in barns. This implies environmental conditions are favorable for life better production (Bahar et al., 2012). Efforts are still to be done in improving the lives of birds, including the protection of farms by the fence and other installations. These elements are absolutely essential to prevent contamination through the intrusion of people, animals and vehicles in operation (Falconi and Santos, 2007). It is the same equipment for personnel protection that should be implemented in all farms, which is not yet the case in some farms. Protection farms must be the priority points of intervention support services and development projects to improve bio-security in commercial poultry production. Interventions include hand washing, boot washing, changing barn-specific clothing, vehicle sanitation, putting gloves and mask. Mortality management and quarantining sick or new birds are recommended (Danielle and Sarah, 2011). Practicing these recommendations will help to minimize the occurrence of disease and the costs associated with loss of birds.

To improve the statistics in this sector, a device of collecting data at the farm level and their transmission to the statistic services of the Ministry of Livestock must be implemented. For the capacity building of producers' bio-safety projects scuffled within the animal industries and organization of the sector will increase the current production capacity of eggs for consumption.

Conclusion

This study demonstrated the characterization of the broilers and laying hens farms production in NDjamena area. Indeed, the farms performance is related to the production practices especially the unconcerned bio-safety rules. The priority in interventions need is the registration management and the technical capacity building of farmers' bio-security. In addition, the availability and accessibility chicks to veterinary products, food and livestock machinery are also of major concerns and should be taken into account. Demand for poultry products in NDjamena is important. This request should promote the development of semi-industrial production since nearly half of the farms cannot satisfy the demand of the customers. Finally, financial and technical support from the government is required to develop this sector. Its weakness gives way to a massive importation of table eggs to meet the demand.

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