



Original Research Paper

Exploitation of the common guinea fowl (*Numida meleagris*) in the Northern region of Cameroon

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Abstract

Family poultry is an easily accessible source of income and animal protein for low-income populations in developing countries. This study was designed to describe the production system of the guinea fowl in the north region of Cameroon. To achieve this objective, a structured questionnaire was submitted to 72 guinea fowl keepers selected randomly in 7 localities. It emerged that guinea fowl farming is mostly a male business (77.78%). The average flock size is between 5-10 adult animals and the main production objectives are consumption and sales (69.44%). The flocks are constituted from natural incubations carried out by local hens (88.88%); egg production is seasonal and poor, and almost all incubated eggs come from local markets (84.5%), individual collection in the surrounding groves and domestic spawning. Guinea fowls are in a scavenging system (66.66%) and merely housed. Birds often benefit from few handfuls of cereals (corn seeds and millet) and home wastes. Keets' mortality rate is higher (80.55%) among those aged between 8 to 12 days. Majority of guinea fowls' keepers (76%) do not practice any health monitoring. The technical and financial constraints are the major challenges to the development of guinea fowl production. The organization of producers, the dissemination of appropriate technologies and support with enabling policies and private sectors would improve the overall production performance and thus the rational exploitation of this native genetic resource.

Keywords: Guinea fowl, production system, husbandry, northern Cameroon

Introduction

Among the means to generate income and improve animal protein availability, most third world countries populations have made of family poultry an important livestock sector. This activity is performed by more than 80% of rural populations (Fotsa, 2008). Family poultry, which is widespread among the population is characterized by small numbers and for most parts, the association of several native species of poultry: chicken, duck, turkey, etc. (Laurenson, 2002; Dahouda et al., 2009). Guinea fowl (*Numida meleagris*) is a domestic bird kept for its eggs and white meat (Jacob and Pescatore 2013). In the Sudano-Sahelian region of Africa, guinea fowl is one of the most common species in small scale family farms (Dei and Karbo 2004; Dongmo 2016). It is generally raised in small numbers for its socio-economic and cultural interest, as well it is used for traditional rites, funerals and gifts. Guinea fowl farming is a rapidly developing economic business related to health, education and agriculture needs (Teye and Adam 2000; Avornyo et al., 2013; Dei et al., 2014).

Likewise in most dry areas of Africa, northern Cameroon included, the local guinea fowl is one of the livestock species which is likely to less suffer effects of dryness and then cope better in harsh environment (Dahouda et al., 2009). Guinea fowl is therefore relatively exploited in a rambling and an undemanding system. Beyond its adaptation to dryness, the guinea fowl is not subjected to any taboo.

Its meat is a source of high-quality animal protein because it is low in fat (Moreiki and Seabo, 2012; Huart et al., 2014). In addition, guinea fowl farming is a stable livestock enterprise for low-income populations. Despite all the good facts that the husbandry of this poultry species generates, guinea fowl remains under-exploited in Cameroon, which is explained by the scarcity of scientific work on this subject (Dongmo et al., 2016). The present work aims at characterizing the exploitation of this species in the northern region of Cameroon.

Materials and Methods

Description of the study area

The Northern region (Figure 1) extends between 8° and 10° northern and between 12° and 16° eastern. The study was located between North and Far North administrative regions, which share boundary with Chad and Central Africa Republic (east) and Nigeria (west). The region is made up of four administrative divisions, namely Benue, Mayo-Louti, Mayo-Rey, Faro and covering about 65,576 km² and hosting 1,227,000 inhabitants (INS, 2013; Hamadou, 2016). The climate is of Sudanian type, with 6 months of rain and with an average temperature of 35°C. Natural vegetation is made of up of dry grass savannah, woody savannah, gallery forests and mountain vegetation. Two large rivers drain the region: Benue and Faro; there are also many seasonal streams called *Mayo*, which often dry up after rainy season. The human population is diversified with socio economic divisions. The Bororo group is mostly ruminants' keepers, and Hausa are mainly traders; recent immigrants groups made up of Laka, Toupouri, Massa, Matakam and others are mostly farmers. Agricultural activities (thus livestock) occupy 90% of the population (Hamadou, 2016).

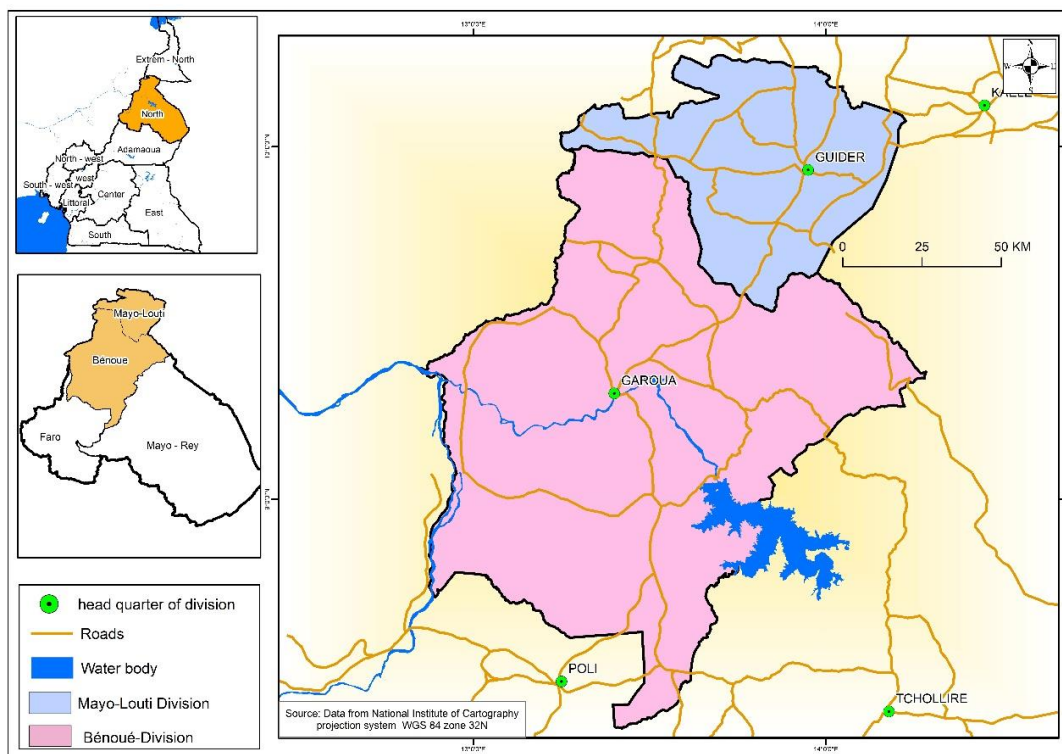


Figure 1: Map of study area of guinea fowl exploitation in Northern Cameroon

Data collection and statistical analysis

The data were collected through a direct interview of 72 guinea fowl keepers selected randomly in 7 localities of two divisions (Benue and Mayo Louti) in the northern region between August and September 2017. The choice of the two divisions was motivated by reports from the Ministry of Livestock describing the relative abundance of guinea fowl farming in these zones compared to other divisions (DREPIA, 2016). Data collected were about keeper gender, breeding objective, and origin of guinea fowl, husbandry techniques (housing, food, health and reproduction) and trading features. All these were recorded in an elaborate survey frame following the experimental protocol proposed by FAO (2013) and adapted by AU-IBAR (2015) for the characterization of poultry genetic resources. The data set was submitted to descriptive statistics using SPSS 21.0 software. The significance level of the contingency or independence test was performed at $p < 0.01$.

Results

Production objectives and flock size

Table 1 shows the keeping objective, the keeper's gender, the number of birds reared and the keepers' main activities. The majority of guinea fowl farmers are men (69.44%), with some having no formal education whereas few have a primary school level. The production objectives are generally own-consumption (69.44%) and sales (30.56%). The main flock size range (87.50% of the flocks) is 1 to 10 adult animals. These figures would not be suitable for profit making with guinea fowl farming in northern Cameroon. Within the 72 respondents, 90.27% are small-scale farmers, which explains the insufficient management of guinea fowl keeping in the region. Farmers spend much of their time in crop production and have then very little importance to guinea fowl farming, which is considered a part time activity. The contingency test shows that there is no significant difference between the different parameters and the different localities indicated, close or remote sites from Garoua urban center have the same patterns.

Table 1: Production objectives, owners' gender, flock size and guinea fowl keepers' main activities in Cameroon northern region localities

Localities	Production objectives		Gender		Flock size		Main activities of breeders		
	Consumption	Sales	M	W	[1-11[[11-16[Farmer	Trader	Civil servant
Douroum	8.33	1.38	1.38	8.33	9.72	0.00	9.72	0.00	0.00
Figuil	8.33	2.77	1.38	9.72	11.11	0.00	9.72	1.38	0.00
Garoua III	54.54	9.72	9.72	25.00	29.16	5.55	19.44	2.77	0.00
Guider	54.54	4.16	1.38	9.72	8.33	2.77	9.72	1.38	1.38
Mayo-oulo	13.88	5.55	4.16	15.27	15.27	4.16	12.50	1.38	0.00
Tcheboa	2.77	2.77	0.00	5.55	55.55	0.00	4.16	1.38	0.00
Touroua	4.16	4.16	4.16	4.16	8.33	0.00	4.16	0.00	0.00
Freq.(%)	69.44	30.56	22.22	77.78	87.50	12.50	90.27	8.35	1.38
C.t	*								

M: Man; W: Woman; Freq.: Frequency; C.t: Contingency test; *: non-significant ($p > 0.0$).

Housing and livestock equipment

Findings (table 2) show that 66.66% of farmers do not have accommodation for guinea fowl. The animals spend the night shelter less or most often by making a space in the old non used granaries known as "seko" in search for heat and escape from many predators that roam in the night. For farms that practice poultry housing, shelters are usually made from local materials such as cotton and sorghum stalks or red millet, all covered with straws. Similarly, around 88.88% of these farms have no equipment (feeder, water trough or heating system). (Figure 2)

Table 2: Housing and equipment for guinea fowl production in the northern Cameroon

Localities	Housing		Types of housing		Equipment		Heating system	
	Absent	Present	Traditional	Modern	No	Yes	Present	Absent
Douroum	5.55	4.16	4.16	0.00	9.72	0.00	0.00	9.72
Figuil	8.33	2.77	2.77	0.00	9.72	1.38	0.00	11.11
Garoua III	23.61	11.11	11.11	0.00	29.16	5.55	0.00	34.72
Guider	2.77	8.33	6.94	1.38	8.33	2.77	0.00	11.11
Mayo-oulo	12.50	6.94	6.94	0.00	18.05	1.38	0.00	19.44
Tcheboa	5.55	0.00	0.00	0.00	5.55	0.00	0.00	5.55
Touroua	8.33	0.00	0.00	0.00	8.33	0.00	0.00	8.33
Freq. (%)	66.66	33.34	95.83	4.17	88.88	11.12	0.00	100.00
C.t	*							

Freq.: Frequency; C.t: Contingency test ; *non-significant ($p>0.0$).



Figure 2: Typical guinea fowl housing

Feeding, watering, sex identification and sex ratios of guinea fowl flock

Table 3 shows that cereals (maize, sorghum, red millet) are the main sources of feed for 87.5% of farmers. These are always poured on the ground for household birds to feed on. This feeding mode is detrimental to guinea fowl which are usually chased by hens and ducks, in most cases of mix-poultry systems which is largely practiced in the region. With the exception of rare keepers (less than 10%) who take the time to put water in adapted water containers as drinkers (pieces of calabash, broken canaries and pots, recycled tin and drum), the majority of households keeping guinea fowls do not have water troughs. It was observed that 90.27% of farmers are able to segregate males from females. The contingency test shows an independence ($p> 0.01$) between the different parameters and the localities (Figure 3).

Table 3: Feed ingredients, water sources, sexing capacity and sex ratios of guinea fowl in Cameroon northern region localities

Localities	Feed materials		Water Sources		Sexing		Sex Ratio		
	Cereals	Wastes	Rivers	Well	Yes	No	1♂/3♀	1♂/4♀	1♂/5♀
Douroum	8.33	1.38	6.94	2.77	8.33	1.38	4.16	1.38	2.77
Figuil	11.11	0.00	4.16	6.94	9.72	1.38	9.72	1.38	2.77
Garoua III	30.55	4.16	31.94	2.77	30.55	4.16	18.05	6.94	6.94
Guider	9.72	1.38	6.94	4.16	11.11	0.00	4.16	4.16	0.00
Mayo-oulo	15.27	4.16	19.44	0.00	18.05	1.38	12.50	4.16	4.16
Tcheboa	4.16	1.38	5.55	0.00	5.55	0.00	5.55	0.00	1.38
Touroua	8.33	0.00	8.33	0.00	6.94	1.38	5.55	2.77	1.38
Freq. (%)	87.50	12.5	83.33	16.67	90.27	9.73	59.72	20.83	19.45
C.t	*								

Freq: Frequency; C.t: Contingency test; ♂:Male; ♀:Female; *: non-significant (p>0.0).



Figure 3: Pecking guinea fowls

Main diseases symptoms, prophylaxis and treatments of guinea fowl

The results (table 4) show that 41.61% of sick animals manifest diarrhea symptoms (gastro intestinal). Other symptoms observed were nasal discharges (respiratory disorders) and general fatigue. The appearance of these poultry diseases symptoms is the consequence of the fact that 94.45% of farmers have no prophylaxis program. There is only a minority who practice preventive treatments on occasional and unreliable basis. The reasons given for this lack of the prophylaxis program include: lack of information (51.39%), lack of financial means (48.61%). Other reasons mentioned are for example the absence of technical advisers and lack of skills. In addition to the absence of the prophylaxis program, 76.39% of the keepers do not practice any curative treatment. The contingency test shows that there is no significant difference (p> 0.01) between these parameters and the different localities considered.

Table 4: Main diseases symptoms, prophylaxis and guinea fowl treatments in Cameroonnorthern region localities

Localities	Main diseases symptoms			Prophylaxis		Why no prophylaxis		Treatments	
	Diarrhea	Fatigue	Nasal Flow	Often	No	Means	Information	Yes	No
Douroum	5.55	1.38	2.77	1.38	8.33	6.94	2.77	1.38	8.33
Figuil	1.38	5.55	4.16	0.00	11.11	4.16	6.94	4.16	6.94
Garoua III	12.50	6.94	13.88	2.77	31.94	11.11	23.61	4.16	30.55
Guider	9.72	0.00	1.38	0.00	11.11	8.33	2.77	4.16	6.94
Mayo-oulo	13.88	5.55	1.38	0.00	18.05	13.88	5.55	2.77	16.66
Tcheboa	1.38	0.00	4.16	0.00	5.55	0.00	5.55	0.00	5.55
Touroua	4.16	0.00	4.16	1.38	8.33	4.16	4.16	6.94	1.38
Freq.(%)	41.61	26.45	31.94	5.55	94.45	48.61	51.39	23.61	76.39
C.t	*								

Freq: Frequency; C.t: Contingency test; *: non-significant (p>0.0).



Figure 4: Typical sick guinea fowls

Daily laying performance, egg-laying period and incubation modes in guinea fowl

About 59.72% of farmers report having an average of 4-6 eggs laid per day for a mean flock size of 10 individuals (table 5). More than 84% of farmers do not monitor the number of their daily egg losses. Egg laying is seasonal and happens between the months of June and July (51.38%). Eggs collection is usually performed by household youths who regularly roam around the homesteads to look for eggs laid in the bushes. Eggs are incubated naturally (88.88%) by hens for about a month (28 days). According to farmers, the incubation of guinea fowl eggs by chickens is often dilemmatic because chickens easily recognize their eggs when mixed with those of the guinea fowl. the problems of the genetic diversity of the local hen, there is a problem of animal welfare and ethics that are inherent to this reproduction system.

Table 5: Number of eggs laid per day/flock, number of broken eggs, egg-laying period and type of incubation of guinea fowl eggs in Cameroonnorthern region localities

Localities	Number of eggs laid / day/flock				Broken EAL		Egg-Laying period			Brooding	
	[1-3]	[4-6]	[7-9]	[10-12]	Unk	Numb	Ap-May	Jn-Jly	Ag -St	G.fowl	Hen
Douroum	0.00	5.55	2.77	0.00	6.94	2.77	1.38	4.16	4.16	0.00	9.72
Figuil	2.77	6.94	1.38	0.00	8.33	2.77	1.38	5.55	4.16	1.38	9.72
Garoua III	2.77	20.83	9.72	1.38	30.55	4.16	8.33	16.66	9.72	4.16	30.55
Guider	0.00	4.16	5.55	1.38	11.11	0.00	1.38	5.55	4.16	1.38	9.72

Mayo-oulo	0.00	11.11	6.94	1.38	15.27	4.16	2.77	11.11	5.55	2.77	16.66
Tcheboa	1.38	4.16	0.00	0.00	4.16	1.38	0.00	4.16	1.38	1.38	4.16
Touroua	2.77	5.55	0.00	0.00	8.33	0.00	1.38	4.16	2.77	0.00	8.33
Freq.(%)	9.72	59.72	22.22	8.33	84.72	15.28	16.66	51.38	31.96	11.12	88.88

C.t

*

Unk : Unknown ; Numb: Number; EAL: eggs after laying ; Ap: April; Jn: June; Jly: July; Ag: August; St: September; G.fowl: Guinea fowl. **Fr**: Frequency; **C.t**: Contingency test;: Number of Eggs Broken; *: non-significant (p>0.0).



Figure 5: Mother hen driving guinea fowl keets

Keets’ mortality, losses and causes of guinea fowl

About 50% of keets die before their first ten days subsequent to the lack of suitable housing and a heating system for guinea fowl (table 6). Observed losses are from various sources and including 61% of farmers mentioned animals’ losses due to illnesses (45.45%), theft (31.83%) and predation by stray dogs (22.72%).

Table 6: Incubation duration, keets’ age at death, losses of guinea fowl and the causes in Cameroon northern region localities

Localities	Incubation duration (days)				Keets’ age at death			Losses		Causes of the loss		
	[27]	[28]	[29]	[30]	[1-5]	[5-10]	[10-15]	Yes	No	Dog	Diseases	Theft
Douroum	6.94	1.38	1.38	0.00	0.00	2.77	6.94	4.16	5.55	0.00	6.81	0.00
Figuil	2.77	2.77	1.38	4.16	0.00	8.33	2.77	5.55	5.55	0.00	9.09	0.00
Garoua III	0.00	15.27	6.94	12.50	0.00	12.50	22.22	23.61	11.11	11.36	13.63	13.63
Guider	1.38	8.33	1.38	0.00	0.00	8.33	2.77	5.55	5.55	2.27	6.81	0.00
Mayo-oulo	1.38	9.72	4.16	4.16	1.38	9.72	8.33	11.11	8.33	4.54	2.27	11.36
Tcheboa	0.00	2.77	1.38	1.38	0.00	4.16	1.38	5.55	0.00	4.54	0.00	4.54
Touroua	0.00	4.16	2.77	1.38	0.00	2.77	5.55	5.55	2.77	0.00	6.81	2.27
Freq.(%)	12.51	44.44	19.44	23.61	1.38	48.62	50.00	61.11	38.89	22.72	45.45	31.83

C.t

*

Freq.: Frequency; **C.t:** Contingency test; *: non-significant (p> 0.0).

Guinea fowl trading features

Results (table 7) from this study attest that the majority of sold animals are males (55.55%) and the unit price varies between FCFA 2,000 and 2,500 (around USD 3-4). Majority of mature birds are sold in local markets (98.31%). The unit price of the animals is not fixed during the year, it varies mainly according to the weight of the animal (69.51%) and the color of the animals (20.23%) and sometimes according to the seasons. The relative abundance of chickens on the market is raised as another factor, for chickens are relatively cheaper, although it is believed that chicken taste differs from guinea fowl. Eggs constitute a major source of income in guinea fowl keeping. They are sold on local markets or roadside by street traders. These traders roam the surrounding villages to negotiate with the farmers. Eggs are sold in packages of 6 or 8 at FCFA 500 (around USD 1).

Table 7: Sex of animals sold, unit price, sales places and factors influencing the prices in Cameroon northern region localities

Localités	Sex of the animals sold			Unit price (CFAF)				Place of sales		Factors influencing the prices		
	♂/♀	♂	♀	UP1	UP2	UP3	UP4	Markets	Hotels	Weight	Chikens	Color/sex
Douroum	1.38	4.16	1.38	0.00	0.00	8.47	0.00	8.47	0.00	5.08	0.00	3.38
Figuil	0.00	6.94	0.00	0.00	0.00	6.77	3.38	8.47	1.69	6.77	1.69	1.69
Garoua III	0.00	20.83	4.16	1.69	18.64	15.25	1.69	37.28	0.00	25.42	3.38	8.47
Guider	0.00	4.16	2.77	0.00	1.69	10.16	0.00	11.86	0.00	10.16	0.00	1.38
Mayo-Oulo	0.00	11.11	2.77	0.00	6.77	8.47	1.69	18.64	0.00	15.25	0.00	5.08
Tcheboa	0.00	4.16	0.00	0.00	1.69	2.77	1.69	6.77	0.00	3.38	1.69	0.00
Touroua	0.00	4.16	1.38	1.69	5.08	1.69	0.00	6.77	0.00	3.38	3.38	0.00
TotalFr.(%)	1.38	55.55	43.07	1.69	35.59	54.23	8.49	98.31	1.69	69.51	10.16	20.33
C.t												*

CFAF : CFA franc; UP: Unit Price; UP1 : [1,000-1,500[; UP2 : [1,500-2,000[; UP3 : [2,000-2,500[; UP4 : [2,500-3,000]

Freq.: Frequency; ♂: Male; ♀: Female **C.t:** Contingency test; *: non-significant (p>0.0).

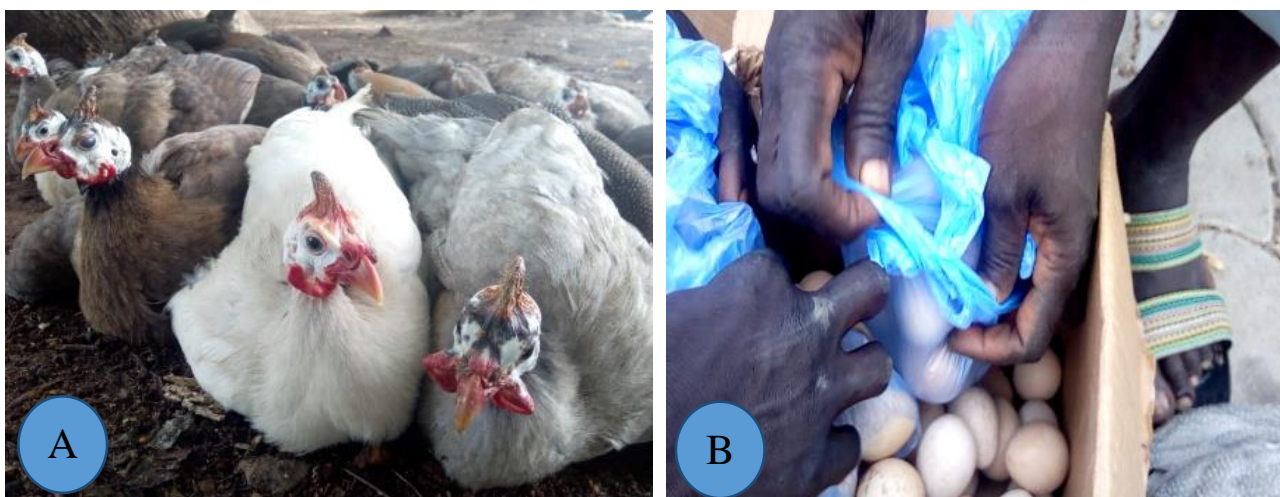


Figure 6: Guinea fowl stored after purchase (A) and Storage of eggs(B)

Trading constraints of guinea fowl

There are several factors hampering guinea fowl trading of in the region (table 8). The most cited is transportation-related stress (61.11%). Guinea fowls are very fearful, and thus itineraries and poor handling resulting from transportation disrupts them usually leading to the death of several animals before arrival on the markets. Moreover, in scavenging system, collecting and handling live animals is challenging, for birds are not housed and tend to stand and hide on trees or on the houses.

Table 8: Difficulties in marketing, perception of satisfaction level and reasons of non-satisfaction of guinea fowl keepers in some Cameroon northern region localities

Localities	Difficulties related to the marketing			Satisfaction		Reasons of the non-satisfaction		
	Handling	Transport	Chickens	No	Yes	Knowledge	Theft	Funding
Douroum	2.77	5.55	1.38	8.33	1.38	8.69	0.00	1.44
Figuil	2.77	5.55	2.77	8.33	2.77	8.69	1.44	0.00
Garoua III	6.94	23.61	4.16	33.33	1.38	33.33	1.44	0.00
Guider	1.38	5.55	4.16	8.33	2.77	8.69	0.00	2.28
Mayo-oulo	6.94	9.72	2.77	16.66	2.77	17.39	2.28	0.00
Tcheboa	0.00	5.55	0.00	5.55	0.00	5.79	0.00	0.00
Touroua	2.77	5.55	0.00	2.77	5.55	2.28	1.44	2.28
Freq.(%)	23.62	61.11	15.27	83.33	16.67	85.50	7.25	7.25
C.t					*			

Freq: Frequency; **C.t:** Contingency test; *: non-significant ($p>0.0$).

Guinea fowl major constraints

Several difficulties have been raised to explain the overall low production observed in farms. Among these constraints, the health points out as the first with high mortality rate (48.62%) of keets in the first nine days. Genetic material is not monitored or known by users with their potentials ascertained. For reproduction, local native guinea fowl does not lay when caged and lack ability to hatch without proper assistance. Technical skills are lacking in various domains: biosecurity standards, feed formulation, housing system and incubation improvement. Security is another serious challenge: transport stress, theft and predation by dogs. Lack of public and private support is another issue raised by guinea fowl keepers, for this bird is not considered in the public extension and training packages. Concerning the satisfaction with their activities, about 83.33% of farmers claim production level very low, and then not satisfactory. The technical skills and guinea fowl husbandry know-how are shallow (85.50%), and the reason why is related to the absence of the public enabling policies (7.25%).

Discussions

As already pointed out by Dongmo et al (2016) on the characterization of the production of guinea fowl in the Sudano-Sahelian zone of the Far north of Cameroon, guinea fowl keeping in the Cameroon North region is carried out for own-consumption and income generation. It is an extensive family poultry system with relatively low inputs and thus low production performance. It is a subsistence activity, though it is a source of income easily mobilized through sales of live birds and mainly eggs (Djovonou, 2010). Meutchieye and Dongmo (2018) have also shown that trading is the principal reason of rearing guinea fowl and mostly its eggs in Cameroon Far north region. Guinea fowl farming is associated with other poultry species with flock size generally less than 20 adult birds (Laurenson, 2002). Avornyo et al. (2016) in Ghanaian the characterization of guinea fowl production in twenty districts found that guinea fowl farming is extensive with no adequate housing and no prophylaxis system nor animal treatment, which is similar to the current observations. Majority of keepers have little or no capacities concerning the birds' health care and how to address pathological cases. Likewise, guinea fowl keepers make use of various ethnoveterinary techniques and recipes to treat animals.

In other African regions, guinea fowl keeping is largely dominated by men (Avornyo, 2009), which is not the trend observed in this study where women and youths were largely involved. Although men are the owners, women take care of the daily monitoring of animals while men make decisions and solve problems related to the collection of eggs (Ikani and Dafwang, 2004; Sanfo et al., 2009; Moreiki and Seabo, 2012; Dongmo and al., 2016). Eggs are brooded naturally by hens and incubation lasts an average of 28 days.

Mortality as observed by Teye and Adam (2000) and Boko (2011) is high among keets during the first week after hatching.

While guinea fowl farming lacks inputs for its development in Cameroon, it is established poultry business in other places, for instance, in France and few African countries where guinea fowl is farmed in intensive system with a high level of productivity (Dahouda 2003; Champagne and Levêque 2007; Champagne and Segret 2013). In these contexts, high-level selection has been done to have fast growing strains. In Cameroon the genetic resource derive from unknown sourcing, mostly market-bought eggs or eggs collected from surrounding bushes (Dongmo et al., 2016).

The Guinea fowl farming has several constraints (technical, financial, managerial...) that hamper both production and productivity (Boko, 2004; Dahouda and al., 2007; Boko and al., 2012; Gono, 2013). All these results help to investigate significantly on enabling factors to harness guinea fowl farming in Central Africa and beyond.

Conclusion

This paper shows that the main production objective of guinea fowl is own-consumption and marketing. Although most men are poultry owners, daily management is the responsibility of women and children. The flock size is generally low and in most cases, the farming is associated with other poultry species. The Guinea fowl farming is extensive with absence of housing. The mortality rate of keets is very high compared to adults. Hens do the incubation of the eggs naturally, the duration is around a month on average, and the laying is seasonal. The marketing of eggs and guinea fowl is done in local markets. The North region of Cameroon has a significant guinea fowl potential, which remains to be exploited. Improving the production of guinea fowl in the Sudano-Sahelian zone of Cameroon in general and the north region of Cameroon in particular needs the control and training of local farmers on breeding techniques, feeding, housing, and biosecurity. Major constraints to improved guinea fowl husbandry in the region are technical, financial and institutional. A rational exploitation of this animal genetic resource. Wider characterization involving the national subpopulations of guinea fowls could lead to selection program based on powerful genetic tools and other interesting traits. Such findings could help policy makers for decision-making and would be beneficial for the preservation and genuine exploitation of this native bird species.

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