

Indigenous Chicken production in Niger

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ARTICLE INFO

Keyword:

Local chicken
Diversity
Breeding
Characterization
Niger

ABSTRACT

The breeding of local chicken is an important source of animal protein and income for the rural populations of Niger, and the improvement of its productivity requires a better knowledge of production practices. Hence, a socio-economic and technical survey was undertaken from July to August 2017 in order to provide necessary information on the practice of family poultry keeping in Niger. For this purpose, two hundred and sixteen (216) producers were interviewed in the different agro-ecological zones of Niger using structured questionnaire. Results from the study revealed that 43.1% of local chicken producers are women. The most production purpose of the chicken in Niger is for selling (38.31%), self-consumption (37.74%) and donation (22.99%). Scavenging is the most dominant feeding system (92.1%). Constraints related to family poultry production as identified by the study are mainly diseases (45%), lack of housing (16%) which favors predation, lack of food (11%) and lack of training (8%). It is clear that the development of the sector necessarily involves strengthening the surveillance of avian diseases, coupled with veterinary monitoring and supervision of producers.

1. Introduction

In Africa, family poultry production is practiced by more than 80% of the population, mostly concentrated in rural areas, and plays an important economic role for rural, urban and peri-urban areas (Fotsa, 2008).

In Niger, poultry breeding is dominated by family poultry, which accounts for 96% of all local breeds combined, compared with 3% for modern breeds. In the total of indigenous poultry Chicken represent 55% (RGAC, 2008). This activity contributes to the food security of populations, particularly in rural areas where it is the main source of animal protein (Amadou Moussa, Idi, & Benabdeljelil, 2010), and contributes also to the reduction of poverty in the peri-urban and rural areas by providing substantial income for producers (RGAC, 2008). However, the keeping of the local chicken of Niger meets several problems like the producers' lack of knowledge about relevant conditions of production, health care. It is to overcome this lack of knowledge that this socio-economic and technical characterization study was initiated in order to provide necessary information on the practice of rural family poultry keeping production and to consider the prospects for improvement.

2. Material and methods

2.1. Area of study

The study covered 24 localities/villages across the four agro-ecological zones of Niger. These agro-ecological zones do not receive the same annual rainfall: Sahelo-Sudanian zones (600–800 mm/year), Sahelian (300–600 mm/year), Sahelo-Saharan (300–150 mm/year) and Saharan zone (less than 150 mm/year) (PANA, 2006). The distribution of localities by zone was made by considering the producing areas of the local chicken. Six localities were sampled in the Sahelo-Sudanese zone, 12 localities in the Sahelian zone, 4 localities in the Sahelo-Saharan zone and 2 localities in the Saharian zone (Fig. 1).

2.2. Data collection process

The target group of this survey are both men and women producing local chicken. A total of 216 local chicken producers were sampled throughout the whole country with an average of 9 producers/locality. The selection of these producers was guided by the head of each village who knows best who is practicing and having more seniority in family poultry keeping.

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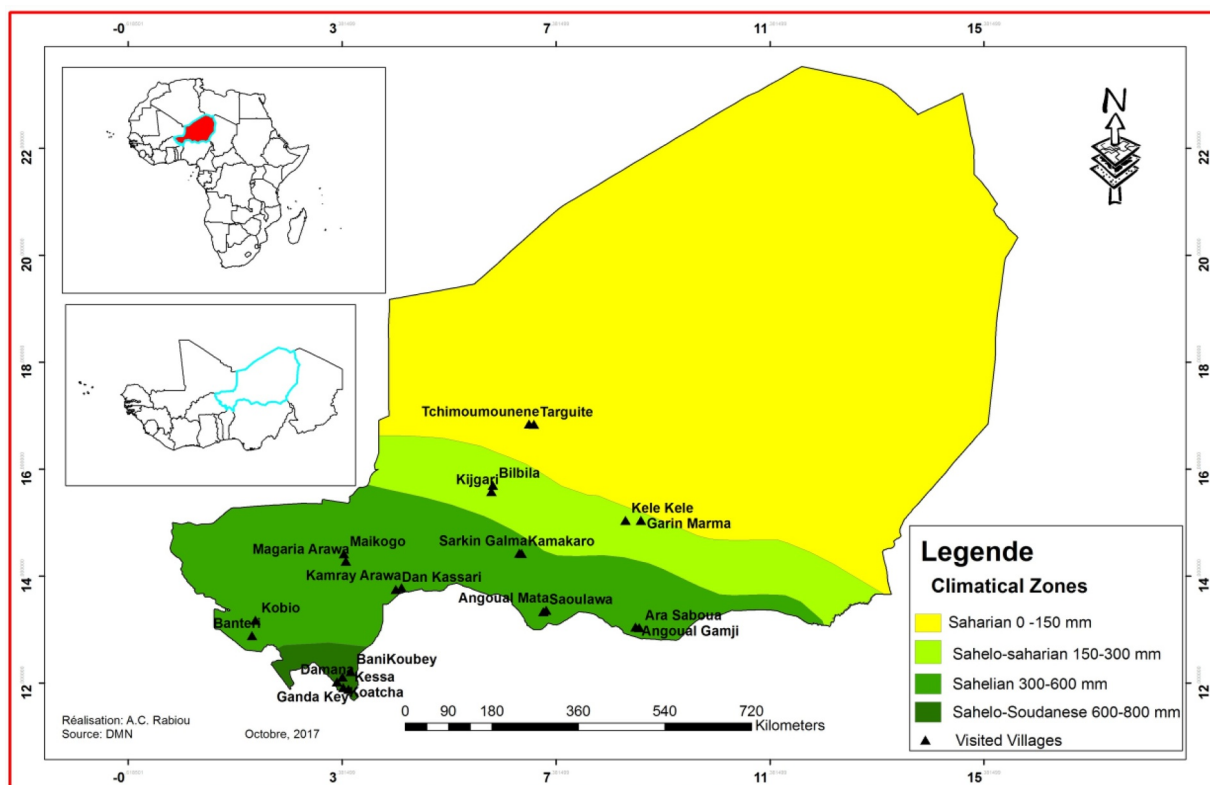


Fig. 1. Distribution and number of areas sampled by agro-ecological zone.

An interview was carried out with each producer to inquire about his/her practice of local chicken production (whole questionnaire in Annex A). Most often, the interviews were done in the morning while taking care to inform the producers before through the village chief.

2.3. Ethical Statement

The National Committee of Ethics on Health Research authorized us to collect this data (authorization No.010/2017/CNERS).

All the producers who participated in this survey were first informed about the main purpose of the study and their participation was voluntary and anonymous. A verbal agreement was obtained from each producer at the beginning of his interview.

2.4. Data analysis

All the data collected were processed with Excel 2016 and subjected to a descriptive analysis with SPSS software (Statistical Package for Social Sciences.) Version 18.0.

3. Results

3.1. Socio-economic characteristics of producers

Local chicken breeding in Niger is practiced majority by men (56.9%). These producers are mostly married (86.1%) and 49.5% of them are between 30 and 50 years old. The practice of poultry farming in Niger is an old activity (67.6% of the respondents kept poultry for more than 5 years). Personal investment is the main source of funding for local chicken farming in Niger (82.4%). The majority of producers (81.5%) have never received training or capacity building on the practice of poultry farming. The main objective of the local chicken breeding in Niger is selling (38.31%), self-consumption (37.74%) and gift/donation (22.99%) (Table 1).

3.2. Composition of the poultry flock

The poultry flocks consisted of several species. The average flock size of chicken represents the largest proportion. Out of a total of 2596 poultry encountered, 59.20% are chicken. This number of chicken is followed by the guinea fowl (18.70%), then the pigeons (15.51%) and finally the ducks, geese and turkeys with respectively 6.11%, 0.34% and 0.14% (Table 2).

3.3. Technical characteristics

3.3.1. Housing and feeding

Not all producers have a particular habitat built with modern materials for their poultry. The habitats that have found with some producers (39.4%) are made of temporary materials (thatch, tree or shrub branches, clay) (Fig. 2). These habitats are most often used as dormitories for chickens. The majority of producers (88.4%) are not feeding their poultry. These poultry are forced to feed themselves by scavenging. Scavenging is the most frequent production system (92.1%) in the keeping of the local chicken in Niger (Table 3).

3.3.2. Health management of local chicken in Niger

3.3.2.1. Symptoms of frequent diseases. The most common symptoms of Newcastle disease are diarrhea (45.32%), screaming or sometimes coughing (21.72%), prostration (19.48%) or saliva leaking from the chicken's beak (8.24%). For avian pox, the symptoms are swelling of the head (50%) or pimples that appear on the beak or in the eyes (50%). The symptoms of parasitosis are weight loss (55%), diarrhea (36.25%) and drowsiness (8.75%).

Table 4 presents the symptoms of the common diseases of the local chicken of Niger.

3.3.2.2. Traditional treatment of frequent diseases. Avian pox (viral disease) does not have a specific medicine. Treatment is simply to

Table 1
Socioeconomic Status of local chicken breeders.

Parameters and variables	Sample size	Frequencies (%)	Parameters and variables	Sample size	Frequencies (%)
Producer gender			Secondary activity		
Women	93	43.1	Animal production	155	71.67
Men	123	56.9	Trade	40	18.43
Total	216	100.0	Fishing	3	1.37
Age group			craft	13	6.14
< 30	47	21.8	Household	3	1.36
30–50	107	49.5	civil servant	1	0.68
50–70	58	26.9	Student	1	0.34
> 70	4	1.9	Total	216	100.0
Total	216	100.0	Seniority in poultry farming		
Position in the family			< 2	18	8.3
Householder	123	56.9	2-5	52	24.1
spouse	82	38.0	> 5	146	67.6
child	11	5.1	Total	216	100.0
Total	216	100.0	Purpose of poultry farming		
Marital status			Sell	83	38.31
Married	171	86.1	Self-consumption	81	37.74
Single	28	6	Gift/donation	50	22.99
Divorced	5	2.3	Distraction	2	0.96
Widower/widow	12	5.6	Total	216	100.0
Total	216	100.0	Training in poultry breeding		
Source of funding			Yes	40	18.5
Personal funding	178	82.4	No	176	81.5
Credit	2	0.9	Total	216	100.0
Grant state	2	0.9			
Gift/donation	18	8.3			
Project	16	7.4			
Total	216	100.0			

Table 2
Composition of poultry flocks and genetic types of hens raised in Niger.

Parameter	Species of poultry	Sample size	Frequencies (%)
Composition of poultry flocks			
	Chicken	2596	59.20
	Ducks	268	6.11
	Geese	15	0.34
	Turkeys	6	0.14
	00Guinea fowl	820	18.70
	Pigeons	680	15.51
	Total	4385	100.0

deflate the wounds (100%) (Table 5). Newcastle disease is also a viral disease that has no treatment. But there is a certain proportion of producers (1.69%) who have developed a prevention technique against Newcastle disease. In fact, these producers isolate themselves with their chicken in their field during the field work. This isolation allows chickens to grow well without risk of contracting this highly contagious disease. Finally, the treatment developed against parasitosis mainly concerns external parasites or ectoparasites. Some producers use ashes (57.63%) to fight against these external parasites, others use a Dichlorvos insecticide commonly known as pia-pia (16.95%), some mix this insecticide with ash or ash with oil. To treat sick chickens, producers apply these products to their bodies.

Table 3
Housing and feeding characteristics of the local chicken in Niger.

Parameters	Modalities	Size of samples	Frequencies (%)
Housing of local chicken			
	No henhouse	131	60.6
	Traditional henhouse	85	39.4
	Total	216	100.0
Feeding			
	Not feeding	191	88.4
	Dietary supplement	25	11.6
	Total	216	100.0
Production system			
	Intensive	3	1.4
	Scavenging	199	92.1
	Mixt	14	6.5
	Total	216	100.0

3.3.2.3. Health monitoring. Among producers, only 38% vaccinate their chicken and 54.6% do not receive visits from veterinary agents at their farm. The mortality rate per year is above 50% for 94.9% of producers. For this reason, the majority of producers noted a period of inactivity of the local chicken production due to avian diseases (82.4%) (Table 6).

3.4. Constraints of the breeding of the local chicken in Niger

Avian diseases constitute the largest obstacle of local chicken



a. Clay habitat b. Habitat in straw c. Habitat in branches

Fig. 2. The different types of traditional habitat of the local chicken in Niger.

Table 4
Symptoms of common diseases in Niger's local chicken.

Diseases	Symptoms Saliva flowing	Twisted neck	Diarrhea	Head is inflated	Button on the beak and/or eyes	blackish comb	Cree/cough	Drowsiness/Prostration	emaciation	Total
ND (%)	8.24	2.25	45.32	1.87	-	1.12	21.72	19.48	-	100
Avian pox (%)	-	-	-	50	50	-	-	-	-	100
Parasitosis (%)	-	-	36.25	-	-	-	-	8.75	55	100

ND = Newcastle disease.

Table 5
Categories of traditional treatment of common diseases of the local hen of Niger.

Diseases	Traditional treatment									Total
	Ash	Peanut oil	Pia-pia (insecticide)	Oil and ash mixture	Pia-pia and ash mixture	Burn their local	Deflate the wounds	Migration	No treatment	
ND (%)	-	-	-	-	-	-	-	1,69	98,31	100
Avian pox (%)	-	-	-	-	-	-	100	-	-	100
Parasitosis (%)	57.63	8.47	16.95	3.39	10.17	3.39	-	-	-	100

ND = Newcastle disease.

production for 45% of producers. Then comes the lack of habitat (16%), predators (12%), food (11%), lack of training (8%), lack of funding (4%), theft (3%) and lack of medication (1%).

Fig. 3 shows the various problems that hinder the raising of the local chicken in Niger.

4. Discussion

The producers of the local chicken of Niger are predominantly men. Despite the predominance of men over women in local chicken farming, it should be noted that it is women who more take care of these chickens because they are constantly at home for housework. The exceed number of producer men compare to the producer female was revealed by Loukou (2013) in Côte d'Ivoire. However, this result is contrary to that found by Fosta (2008) in Cameroon where the number of women producing the local chicken exceeds the number of men. The origin of chickens at startup is very diverse, but mostly chickens are bought. The predominance of purchase in the start-up was found by

Moula, Detiffe, Farnir, Antoine-Moussiauxm and Pascal (2012) in the Democratic Republic of Congo with a proportion of 44.2%. Local chicken in Niger are mainly raised for sale, self-consumption or donation. A similar result was found by Yameogo (2003) in Burkina Faso.

Scavenging is the most widespread production system of the local chicken in Niger. In fact, only 11.6% of producers provide a dietary supplement to their chickens. These food supplements are most often cereal, remains of cooking and sometimes insects. These results from Niger confirm the reality of sub-Saharan Africa where very few farmers give compensatory feed to their chickens. The compensatory feed is quantitatively insufficient and limited to cereals or their emergence with sometimes termites (Bonfoh, Ankers, Pfister, Pangui, & Toguebaye, 1997; Dieng, Gueye, Mahougou-Mouele, & Buldgen, 1998; Konaré, 2005).

The majority of producers do not have housing accommodation for their chicken in Niger. Even those who own them, the henhouses are of traditional type. Generally, these habitats are intended to house the chickens at night or to house hens with chicks. Although traditional,

Table 6
Health monitoring of Niger's local chicken.

Parameter	Samples size	Frequencies (%)	Parameter	Samples size	Frequencies (%)
Vaccination of poultry			veterinary agents visit		
Yes	82	38.0	Once a week	2	0.9
No	134	62.0	Once a month	20	9.3
Total	216	100.0	Once a year	20	9.3
Breeding inactivity period			When need	56	25.9
Yes	178	82.4	Never	118	54.6
No	38	17.6	Total	216	100.0
Total	216	100.0	Mortality rate in case of diseases		
Reason of breeding inactivity	<25%	3	1.4		
Diseases	178	82.4	25-50%	8	3.7
Non-stop	38	17.6	>50%	205	94.9
Total	216	100.0	Total	216	100.0

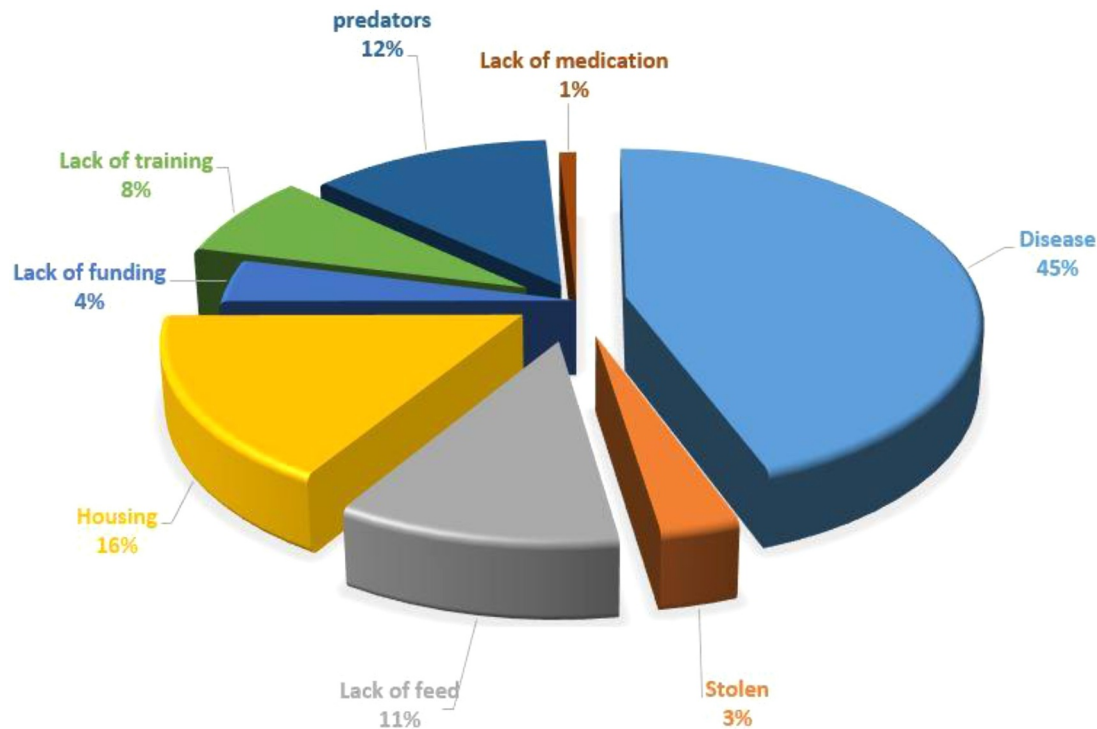


Fig. 3. Main constraints on local chicken farming in Niger.

this type of shelter protects chickens against predators, rains or other bad weather. This result is in agreement with Boussini (1995) in Burkina Faso who showed that some producers build their henhouse with straw to house hens and their chicks at night, while the other birds spend the night on the trees.

The majority of producers do not receive visits from veterinary agents. Those who receive weekly or monthly visits are most often helped by project/NGO grants. Nevertheless, producers have developed traditional treatments for diseases. Newcastle disease, fowl pox, and parasitosis are the most common diseases in Niger. Traditional treatment of producers works more with ectoparasites and avian pox. In Zimbabwe, Mapiye and Sibanda (2005) also reported that farmers use traditional medicine to treat their chickens. This shows that traditional medicine help producer to manage some type of local chickens' diseases. Muchadeyi, Sibanda, Kusina, Kusina, and Makuza (2005) even said that the use of traditional treatment is the most sustainable in terms of health management strategy for households. Unfortunately, much of this type of knowledge is being lost or replaced by modern methods (Gueye, 1999). It is therefore important to carry out a study to determine the methodology and use of each type of traditional treatment in order to develop a traditional poultry pharmacy.

With regard to Newcastle disease, the producers are powerless. This is why this disease is the deadliest of the poultry sector in Niger and even in many countries as Nigeria (Nwanta, Egege, Alli-Balogun, & Ezema, 2008), Botswana (Moreki, Dikeme, & Poroga, 2010) or Mauritania (Bell, Kane, & Le Jan, 1990). It is important to notify a preventive technique against Newcastle disease developed by some producers in Niger. It consists of migrating with their chickens before the beginning of the epidemic and returning on religious holidays (Ramadan or Tabaski) with a large number of poultry. This allows them to make a big profit from selling their poultry. This technique is popularized to reduce the losses caused by Newcastle disease in the poultry world.

Diseases, predators, lack of housing, training and food are the main problems that hinder the development of poultry farming in Niger. In other countries it is mainly diseases and predators that hinder poultry

farming. This is the case of Nigeria (El-Yuguda, Dokas, & Baba, 2005) and Burkina Faso (Pousga, Boly, Linderberg, & Ogle, 2005). It should also be noted that the prevalence of scavenging in the poultry production system contributes significantly to increase the level of impact of these obstacles.

5. Conclusion

Chicken production plays an important role in Niger. The basis of chicken production is still traditional, which leads sometimes to total chicken losses. Epidemics are the main cause of these losses. Before thinking about a breeding program, a minimum of knowledge in the management of livestock, the supervision of livestock farmers through regular monitoring combined with prophylactic measures provided by the government would certainly improve the productivity of chicken and thus contribute to improving the living conditions of producer which are often poor populations.

Acknowledgments

The authors would like to thank, The National Institute of Agronomic Research of Niger for having funded the data collection from this work, the National Committee of Ethics on Health Research for having authorized us to collect this data (authorization No.010/2017/CNERS), the various departmental and communal livestock services for valuable assistance in the selection of villages and in the conduct of investigations.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.vas.2018.11.001](https://doi.org/10.1016/j.vas.2018.11.001).

Annexe A. .

QUESTIONNAIRE N° ()

I-SOCIO-ECONOMIC CHARACTERISTIC

Latitude.....Longitude.....

1.1- Name.....Surname.....

1.2- Gender: Male Female

1.3- Age: < 30 years 30-50 years 50-70 years > 70 years

1.5- Position in the family: householder His wife Son Daughter Relative

1.6- Marital status: Married Single Divorced Widow

1.7- Number of person caring for livestock

1.8- Source of funding: Personal fund Credit Government Subvention Other Specify.....

1.9- Main activities: Agriculture Trading Breeding Hunting Other Specify

1.10- How long are you breeding chickens: < 2 years 2-5 years > 5 years

1.11- Have you been trained in poultr] No

If yes for how long?.....

If no would you like to be trained?.....

1.12- Purpose of poultry farming: Selling Gift Distraction Self consumption

Other Specify

1.13- Did you observe a period that you stop chicken breeding activities? Yes No

1.14- If yes, why did you stop? Luck of income Difficulty of selling Avian disease

Other Specify

II- Technical characteristics

2.1.1. Size of chicken during the survey

2.1.2. The type of chicken: Local Exotic Crossbred

2.1.4. Other poultry speeches bred ?

Breed	Size
Other poultry speeches	Duck
	Geese
	Turkey
	Guinea fowl
	Pigeon
	Other, Specify

2.1.6. Breeding system: Intensive Scavenging Mixt

2.1.8. Reason of the choice of Breeding system: Property Chicken health

Economic Other, Specify

2.2. Housing:

2.2.1. Where are you keeping your chickens? In the same room with us In the specific house No house for chicken Other, Specify

2.2.2. If in the same room, which side? Kitchen Storeroom Other, Specify

2.3. Feeding system:

2.3.1. Are you feeding your chicken?

If yes with what? Cereals Rest of meal
Other, Specify

2.3.2. How many times a day are you feeding your chickens?

Once Twice Thrice Other, Specify

2.4. Chickens health management:

2.4.1. What are the common diseases?

Diseases	Symptoms	Treatment	
		Modern	Traditional

2.4.5. Do you vaccinate your chickens? Yes No Against what ?
1-, 2-, 3-, 4-

2.4.7. Do you receive visits from veterinary agents at your farm?

Yes No

If yes, what is the periodicity? Once a week Once a month Once a year If needed
Other, Specify

2.4.12. What is the mortality rate in case of disease? < 25% 25-50% > 50%

2.5. Constraint of chickens breeding activities:

Which are your constraint in the production of chicken?

Disease Stolen Feeding Lack of housing Financial Lack of training
Other, Specify

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