

A survey study on the use of traditional ration for domestic chickens in Burkina Faso: Case of the rural commune of Pabré

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Abstract

The objective of this study was to examine the feeding practice of traditional poultry farming in Burkina Faso, taking the case of the rural commune of Pabré. The study was carried out through two formal surveys and a practical case of determination of the Scavenging Feed Resources Base (SFRB). Our results indicate that in Pabré, the traditional poultry farming practiced by the great majority of the population is the free range system with the main characteristics of the existence of makeshift henhouse and of the efforts to do feed supplement. The dietary supplement consists of human foods residues. Feed availability for village chicken varies qualitatively and quantitatively not only from one village to another, but also within the same village, from one household to another. This has repercussions on the SFRB which is largely influenced by cereals and is an average of 599.93 g sun dry mater in Pabré. Furthermore, crop content analysis has shown a proportion of cereals and cereal residues of 96%, indicating that energy is predominant in scavenging poultry feeding.

Keywords: available feeds, local chicken, supplementation, scavenging, Burkina Faso

Introduction

According to Hoffmann *et al*, (2019), poultry rearing is widespread in rural Burkina Faso and contributes to both the food security and cash income of smallholder farmers. This poultry production is mainly based on local poultry and Ouedraogo *et al*, (2015) estimated in one rural area of Burkina a proportion of 56.5% of scavenging poultry rearing against 38.2% for semi-scavenging and 5.3% of permanent confinement.

Once a financial source for small needs in rural areas, the breeding of indigenous poultry has now becoming an

activity of very great economic significance for both producers and retailers. Mahoro *et al*, (2017) in Rwanda, who said that indigenous chicken play an important part in household livelihood in terms of food provision and income generation, also indicate such situation. Indigenous poultry farming plays an important role in human nutrition through the supply of protein (Mahoro *et al*, (2017), Alders *et al*, (2018)) and is a factor of integration in the society as it is at the center of social, cultural and religious life (Bonfoh *et al*, 1997).

Among indigenous poultry, village chickens are the most important as Ouedraogo *et al*, indicated that there

proportion is more than 60%. Despite of this strategic importance of village chicken rearing, it must be recognized that in Burkina Faso, local poultry rearing in general and village chicken in particular remains facing enormous difficulties. These obstacles include feed management issues, poultry diseases and poor housing conditions and have repercussions on the productivity of village chickens which remains relatively low. Nowadays, the change in the eating habits of the population (interest in meat products) induces an increase in the demand for meat (Konkobo, 2001) and then a need for growing meat production. Village chickens belonging to the short-cycle type of animal can play a major role in meeting these needs and this implies an improvement in the productivity of village chicken production. To do so, a better knowledge of the management of traditional village chickens production is necessary. The current study was done in such perspective, taking and was carry out of the rural commune of Pabré in Burkina Faso.

Methods

Description of the study area

The present study was carried out in the rural commune of Pabré corresponding to the limits of the department of Pabré and located in the Province of Kadiogo in Burkina Faso. With 21 villages (Yaméogo, 2010), the rural commune of Pabré (Figure 1) covers an area of 411.27 km² And is located between 12 ° 30 North and 1 ° 35 West.

Pabré has a Sudano-Sahelian climate characterized by the succession of two seasons; a rainy season extending from May to October and a long dry season from November to April. This later season is subdivided into the cold season from November to January and the hot season from March to May. The temperature varies between 16.9 and 40 ° C (Yaméogo 2010) and rainfall varies between 300 mm and 800 mm per year.

In the rural commune of Pabré, there is shrub to tree savanna vegetation (Yaméogo, 2010) consisting mainly of tree species such as *Tamarindus indica*, *Vitellaria paradoxa*, *Parkia biglobosa*, *Sclerocarya birea* and herbaceous species as *Anrdropon gayanus*, *Adropogon pseudapricus* and *Loudetia togoensis*. The hydrographic regime is formed by the tributaries of the Nakambé river and three dams were built on these rivers which promote the practice of off-season cultivation.

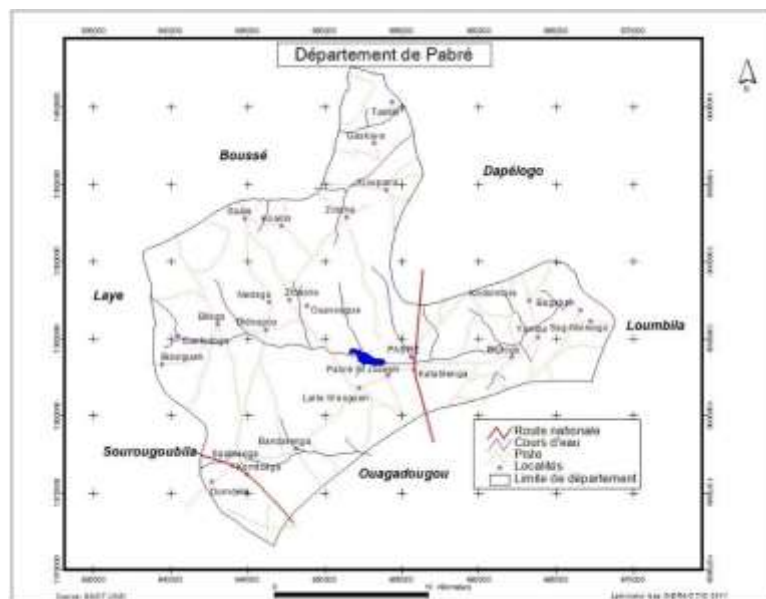


Figure 1: Geographical map of the commune (department) of Pabré in Burkina Faso
Source: from Institut Géographique du Burkina (IGB) reproduced by Lamizana, (2011)

Collection of data

Surveys

The collection of survey data was based on a participatory and inclusive approach. It happened in two phases.

The first phase concerned all households in the target four villages called Katabtenga, Saint Joseph, Pabré center and Ouavougué chosen for their contiguity and according to a transect from rural village to village near the capital Ouagadougou. The administered

questionnaire covered the identification of concessions and households and the description of their poultry farming. In total, the survey reached four hundred and seventy (470) households an exhaustive number of households of various categories (breeders, farmers, agro-pastoralists, civil servants) in the commune of Pabré.

On the basis of the first phase of the survey, a sample of 10% of households in each village chosen randomly was drawn up for the realization of the second phase of the survey. Done at random, this second interview concerned forty-seven (47) households. The

investigations focused in particular on the various activities of producers and particularly breeding. Specifically on the problem of poultry farming, the questionnaire focused on the feeding of poultry, the feeding equipment used, hygiene and the health of poultry farming. In addition, the investigations concerned the constraints in poultry farming.

Collection of household waste

The collection of household waste focused on a sample of sixteen (16) households in the study area, taking into account the representativeness of the four (4) sites. The 16 households are randomly sorted out of the 47 households that were selected for the second survey. In these households, the quantities of household waste were collected daily in a plastic bag for a period of two (02) weeks. At each collection, household waste was weighed and dried. After drying, the residues are visually identified and weighed separately.

Village chicken tracking

The follow-up of village scavenging chickens was done using tracer chickens. It followed the household waste collection phase and involved twelve (12) handpicked households. To do this, an identified chicken called a tracer chicken was followed in each of the 12 households for one day. The 12 households were chosen according randomly among the 16 households where the residues were collected daily. This involved understanding the behavior of the chicken during travel time over the course of a day and assessing the distance traveled during its scavenging. Thus, the movement of the tracer chicken was followed for a whole day by an observer. Thus the most longer distance made by each tracer chicken was spotted by the observer and measured. The day after this follow-up and at the end of the morning, while each tracer chicken was scavenged, it was captured and slaughtered. The contents of the crop were collected and then dried. A visual analysis of the dried contents was made in order to determine the different types of pecked feed and the proportion of household waste eaten by the chicken.

Assessment of the Scavenging Feed Resources Base (SFRB)

The Scavenging Feed Resources Base (SFRB) is data used to determine the capacity of an area to provide feed resources to meet the needs of poultry. According to the FAO (2004), SFRB is defined as all food products accessible to all animals scavenging in a specific area.

For its determination, the formula of Roberts and Gunaratne (1992) cited par Sonaiya (2006) was used. This formula is as follows:

$$\text{SFRB} = \frac{H}{P} * \frac{n}{n-x} \text{ with:}$$

H, the amount of feed available from household waste produced by each family;
P, the proportion of household waste in the crop of the pecking bird;
n, representing all households in the study unit;
x, the number of households in the study unit that do not keep chickens.

Data analysis

Processing and analysis focused on descriptive information about the socioeconomic characteristics of the sample. The statistical analyzes mainly concerned the proportions and averages. Which means were subjected to ANOVA analysis using SPSS 17 software.

Results

Place of traditional poultry farming in the rural commune of Pabré

Village chickens are too far, the dominant species in breeding in the study area and represents 53.0% of the animal flock size in the area. As shown in Table 1, the average size of the village chicken flock per household is 19.5 chickens. The following species are goat (4.3 head), pigs (3.3 head) and sheep (2.5 head) The results reveal also that, the poultry species are village chickens, guinea fowl and pigeons and traditional poultry farming is far dominated by chickens. It represents 80.9% of poultry species against 9.5% for guinea fowl and also 9.5% for pigeons.

Table 1: Herd size by species and by household

Villages	Size							
	Sheep	Goat	Cattle	Pig	Asins	Village chickens	Guinea fowl	Pigeons
Katabtenga	5	4	2	4	2	20	5	7
St Joseph	1	1	0	2	2	23	1	1
Pabré	3	4	1	4	1	22	1	1
Ouavougué	1	8	1	3	2	13	2	0
Average	2.5	4.3	1	3.3	1.8	19.5	2.3	2.3
Proportion (%)	6.8	11.6	2.7	8.8	4.8	53.0	6.1	6.1

Socio-economic characteristics of traditional poultry farming

Poultry farming is an activity carried out mainly by men as the study reveals that 91.49% of poultry owners are men compared to 8.51% of women (Table 2). However, the role of women in the poultry farming is crucial as they participate individually in the follow up and poultry feeding.

The study reveals that the main object of raising village chickens is for sale as at 89.37% of the case, poultry is raised for sale. The sale is done in a lively state to dealers who are responsible for conveying the poultry to processors in the capital, Ouagadougou. In addition, traditional poultry farming plays an important socio-cultural role because it is used at 10.63% for donations

for the consolidation of social relations, for rites during weddings and sacrifices, and during Christian and Muslim holidays.

Regarding housing conditions, 85.23% of poultry farmers have henhouse for their poultry. These settlements are either made with rammed earth (34.04%), sheet metal (42.68%) or are old abandoned houses (8.51%). In these housing, the collection of droppings in order to fertilize vegetable gardens is used as a pretext for cleaning. It is noted that only 14.77% of poultry farmers do not have housing for poultry and shelters for poultry in these situations consist of trees and walls.

Regarding watering conditions, 95.75% use drinkers in canary pots, wood, pieces of canaries, or used plates versus 4.25% who don't use drinkers.

Table 2: Traditional poultry management

Parameters	Proportion according		Proportion of the type of use of village chicken products		Proportions of farmers using the type of henhouse			
	Men	women	Selling	Others uses	Abandoned house	In clay	In sheet metal	Without henhouse
Owners of the poultry unit	91.49	8.51						
Use of livestock products (village chickens)			89.37	10.63				
Type of henhouse used					8.51	34.04	42.68	14.77

Indigenous Poultry feeding

As indicated in Table 3, the types of feed used to supplement the ration of local poultry are mainly cereals (sorghum, maize, millet) and agricultural by-products (millet and corn bran, local beer-byproduct, cooking residues) as well as termites participate secondarily in village chickens' supplementation. In fact, only 12.77% of poultry farmers use termites and grain bran in poultry feed.

The results of household waste collection (Table 3) reveal that the residues used for feeding the village

chickens are composed mainly of sorghum, rice, beans, thus confirming the survey data. These residues varied both qualitatively and quantitatively from one household to another. In all households, fresh residues made up of kitchen scraps are served early in the morning. As for the dry residues made up of cereals and legumes, they are served primarily in the morning and often in the evening. The results of the study (Table 4) show that the amount of residues collected per day and per household varied from 354.23 ± 17.23 g to 495.46 ± 17.55.

Table 3: Food resources of traditional poultry

Parameters	Supplemented feeds proportion
Type of supplemented feeds used	
Maize and sorghum	53.19
Bran	2.13
Bran and sorghum	19.15
Local beer by-product, bran, cereals	10.64
Bran and termites	12.77
Others	2.12
Source of feeding supplementation	
Food stock	68.09
Purchased food	31.91

Table 4: Average quantity of household waste (in g) emitted per day and per household

Localities	Household waste emitted (g)
Katabtenga	435.58±16.89 ^{ab}
Saint Joseph	443.84±16.73 ^{ab}
Pabré	495.46±17.55 ^a
Ouavougé	354.23±17.23 ^b

NB: On the same column, the values followed by the same letter are not significantly different (P <0.05)

Feeding strategies of the traditional poultry

Traditional poultry scavenge almost the day.

Poultry scavenge around from the opening early in the morning and return towards the end of the morning (11 am). In the afternoon, the poultry resumes their food research on the household compound. Almost all of the poultry day is used for feed research, the intensity of the sun's rays conditioning the poultry scavenging. The large average distance reached when scavenging is closely related to the availability of household waste in the environment. Thus, it appears that among households that produce local beer, there is a very varied availability of scavenging village chickens resources: germinated and non-germinated sorghum grains, local beer by-product, cooking residues. The longest scavenging distance reached by hens in these households is 43.3 m against 77,9 m in households without local beer by-product. The favorite place of traditional poultry during their scavenging is the grain-shelling place.

Feedstuffs of scavenging daily diet

Feeds collected from the households indicated proportions of 60% of sorghum, 15% of local beer by-product, 12% of millet, 7% of maize, 4% of bran, 1% of beans and 1% of undetermined feedstuffs. The crop content of slaughtered tracer chickens, indicated proportions of 48.48% of white sorghum, 25.25% of red sorghum, and 14.14% of local bee-byproduct. Other components are millet (7.7%), maize (2%), beans (2%), cooking residues (1% and unidentified feedstuffs (1%).

Determination of the Scavenging Feed Resources Base (SFRB)

Table 5 shows the Pabré Scavenging Feed Resources Base (SFRB). It was noted that the SFRB is on average 599.93 g sun dry matter. According to the locality, the higher SFRB is in Pabré center with 671.88 g sun dry matter against the lower one in the village of Ouavougé with 466.68 g of sun dry matter.

Table 5: Results of the Scavenging Feed Resources Base (SFRB) (in g) of the rural commune of Pabré

Parameters	Katabtenga	Saint Joseph	Pabré centre	Ouavougué	All Pabré
Number of Households in the study area (n)	79	48	260	83	470
Household waste (H) en g	435.58	443.54	495.46	354.23	432.28
Proportion of household residues (P) from the crop	0.78	0.82	0.83	0.84	0.82
Households not raising chickens (x)	10	9	29	8	57
Household chicken farmers (n-x)	69	39	231	75	413
SFRB in g	639.37	665.18	671.88	466.68	599.93

Discussion

Raising village chickens in Pabré is the participatory work of the whole family. This observation corroborates that of previous authors (Kondombo *et al.*, 2003). Village chickens are to far the dominant specie in poultry farming with a number of 53% of the herd. In the poultry sector, they represent 81.0% of local poultry. This proportion more higher to those of El-Yuguda *et al.*, 2007 and Ouédraogo *et al.*, (2015) which indicated respectively 62% and 63% of village chickens among local poultry. The dominance of village chickens over other species, confirmed by Mpenda *et al.*, (2019), is explained by the relative control of the health of these species and a certain increasing interest of poultry farmers in raising village chickens.

Unlike the work of other authors (Bonfoh *et al.*, 1997; El-Yuguda *et al.*, 2007) which revealed that village poultry farming primarily involves women, in the rural commune of Pabré, 91.49% of poultry owners are men. Women prefer to engage in small business as sale of local bee rents).

It was fund in the current study that 85.23% of poultry farmers have housing, corroborating Sanfo *et al.*, (2009) study indicating that 80 to 86% of poultry farmers have housing. However, it is clear, in agreement with Ayssiwede *et al.*, (2013), that these henhouses do not meet housing standards in terms of ventilation and hygiene.

The diet of traditional poultry is mainly based on scavenging which occurs most of the day. In the study area, the household waste collected, which is largely dominated by cereals, undergoes qualitative and quantitative variations due to the socio-economic conditions of households but also to the period of the year.

Analysis of the contents of the crop revealed a very low presence of insects and the absence of greens. This is undoubtedly linked to the time of year (dry season with

the luck of humidity). Moreover, the season, ecological and socio-cultural conditions influence the food environment of poultry (Pousga *et al.*, 2005, Kondombo *et al.*, 2005). Our study reveals that the supplement is mainly cereals and strongly influences the daily ration of the traditional hen. Indeed, the analysis of crop content showing a proportion of 96% of cereals and cereal residues. This proportions of the crop content in cereals are higher than those obtained by Kondombo (2000) and confirm the assertion of Pousga *et al.*, (2007) according to which, the diet of local chicken consists mainly of energetic feedstuffs. Adamasu *et al.*, (2019) indicated also a crop content of 50.7% of cereals grains in his study in Ethiopia. While the SFRB is energetic, the fact remains that it is limited especially in protein to ensure better growth of traditional poultry. This situation reflects the results of Pousga *et al.*, (2005) according to which, SFRB in Burkina Faso is of low quality with low nutritional value. The, 599.93 g of sun dry matter of SFRB fund in the current study, is quantitatively comparable to those indicated by Sonaiya and Swan (2004) which range between 300 to 600 g of sun dry matter. The relative availability is explained by the time of year (end of a good winter season), the interest in poultry farming through the use of food purchases and the relatively low concentration of households in the study area.

Conclusion

The present study reveals that village chickens occupy an important place in terms of the socio-economic and cultural role they play. However despite its crucial role, village chickens farming has many constraints, mainly the lake of protein in his daily diet as his feeding depends mainly on scavenging. Then, qualitative rations for village chickens remain problematic. .

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