



Constraints to the Development of Sedentary Cattle Farming in the District of Denguele, in the North-West of Cote d'Ivoire

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Abstract— The study was carried out in sedentary cattle farms in the Denguele, District in the North-West of Côte d'Ivoire, the objective of which is to determine the constraints to development in order to propose solutions. A survey was conducted among cattle farmers using the convenience method because of their accessibility. These breeders had a low level of education and were 60% Ivorian. Cattle breeding was the main activity of 47% of breeders. The size of the sedentary herds varied from 30 to more than 100 heads, of which 50% of the farms were between 50 and 99 heads. Comparison of technical data on herd size was found to be significant between farms ($p < 0.05$). The cattle breeds were made up of N'dama and Baoulé with a high rate of interbreeding (51%) between these and the Sahelian zebu. Indeed, the sedentary breeding of cattle was practiced for the purpose of building up savings, a source of income and subsistence breeding. Unfortunately, he was confronted with several constraints: animal pathologies, low food resources, problems of management of natural pastures and cattle production techniques.

Keywords— Sedentary breeding, survey, constraints, cattle breeds, Côte d'Ivoire.

INTRODUCTION

Côte d'Ivoire, while prioritizing crop production for export (coffee and cocoa), has promoted the implementation of coherent incentive programs for animal production (Coulibaly, 2013). To meet the protein needs of the population, it had to make significant outflows of foreign currency linked to imports of livestock products (Kouablé and Tré, 2014). This made it possible to avoid the risks of supply disruptions following the drought of 1972-1973 in the Sahelian countries (UEMOA, 2000). The wealth of the district is essentially agricultural, in particular through the production of cotton intended for export.

Nevertheless, the Ivorian government has felt the need to establish and promote a breeding policy in different regions of the country, including the North and Center of Côte d'Ivoire for the breeding of large and small ruminants and the South for pig and chicken farming or the breeding of short-cycle animals. Thus, the northwestern regions of Côte d'Ivoire, in the Denguélé District, have worked for the productivity and competitiveness of sedentary cattle breeding with breeding practices that comply with zootechnical standards (Essoh, 2006). Unfortunately, these farms with socio-economic interest for the population are faced with



constraints for their development. This study aimed to determine the constraints to the development of cattle breeding in order to propose solutions.

MATERIAL AND METHODS

1- Study area

The study area is the Denguelé District, which has a population of 289,779 inhabitants, mostly rural and agricultural. It includes two administrative regions (Kabadougou and Folon) of which Odienné is the capital (INS, 2014). The climate corresponds to a climatic transition zone between the equatorial climates of the south and the Sudanian climates of the north characterized by two seasons (a long dry season from November to March and a long rainy season from April to October). The relief is relatively monotonous with the presence of scattered hills, many lowlands with ferralitic soils, especially ferruginous and granitic.

2- Sampling

For sampling, only sedentary cattle farms were retained. This is an important selection criterion in the context of the study in order to have a representative sample in each department. The sites were among the 313 cattle farms that were surveyed. Convenience sampling was the method used. This is a non-probability sampling technique where cattle farms were selected because of their accessibility and availability.

3- Characteristics of the farms selected

The study considered data relating to the development constraints of cattle breeding from March 2016 to February 2019 (36 months). The methodology consisted in making a simple and random choice of farms on the basis of the availability of breeders, the presence in the herd of at least 20 breeding females, the existence in the farms of a night pen, a drinker, a feeder and if possible, a containment corridor. The criteria in the choice of farms were their importance and their accessibility in all seasons.

4- Conduct of animals

The staple diet of the animals was natural pasture dominated by *Andropogon gyanus*. However, the supplementary artificial pasture of *Panicum maximum* C1 has been put in place. The grazing time was 8-10 hours per day. At midday, the animals returned to the barn to drink for an hour. Suckler cows and calves received food supplements consisting of maize bran or cracked maize, copra meal, cottonseed, minerals, and crop residues from crop fields. Each cow received as a quantity of concentrate the weight equivalent to half of her milk production the day before (1 to 3.5 kg).

All the animals had free access to the salt lick (salt + minerals). To minimize the variation factors that can influence the reproductive and growth performance, especially of the crossbreeds, in terms of trypanosomosis and ectoparasitosis (ticks), a prophylaxis plan was applied. For animal health monitoring, in addition to the mandatory vaccination campaigns (contagious bovine pleuropneumonia, pasteurellosis and anthrax), cows and calves were treated against gastrointestinal and external parasites using albendazole 300, respectively. (1 bolus per 60 kg

bodyweight), levamisole (7.5 ml per 200 kg bodyweight, Levasol 20% Oral) and cypermethrin (1 ml/L of water, Dominex).

5- Data collection and analysis

Among the 313 farms in the Denguelé District, surveys were carried out to determine the mode of acquisition of farms, the breeds exploited, and the constraints linked to the development of livestock farming, in particular, feed and pasture management, breeding techniques, and pathologies.

The statistical analysis of the data was carried out with Excel version 2013 and XLSTAT 2020 version 5.1 software. Comparisons of zootechnical parameters were made using the Mann-Whitney U Test. The significance threshold was set at 5% ($p < 0.05$).

RESULTS

1- Mode of acquisition of the breeding herd

There are three modes of acquisition of breeding cattle (acquisitions by purchase, by donation and by inheritance). It was observed that 49% of breeders acquired their livestock by purchase, 9% by purchase and donation, 18% by purchase and inheritance, 20% by inheritance and 4% by donation. However, some herds are subject to all these modes of acquisition (Figure 1).

2- Characteristics of breeding herds

The cattle breeds reared are the local breeds (Baoulé and N'dama), the Sudanese Fulani zebus and the cross or hybrid breeds (N'Dama x Zébu) whose cross breeds represent 51% of the farms encountered (Figure 3).

The herd size of cattle farms is variable, ranging from 30 to 49 head for 21.83% of farms, from 50 to 99 head for 50.90% of farms and 100 head or more for 27.27% of farms. Comparison of technical data on herd size was found to be significant between farms ($p < 0.05$).

60% of breeders are Ivorians and cattle breeding represents the main activity for 47% of breeders. However, their level of education is low, around 60% primary level (Figure 2).

3- Livestock management

The parks are most often located at the exit of the villages whose driving is entrusted to a herdsman. The latter benefits from the daily milk obtained from the milking of suckler cows as an accessory to the salary.

It should be noted that 62% of breeders practice savings breeding, 24% commercial breeding and 14% subsistence breeding (Figure 3). All of the farms encountered essentially practice the type of mixed production (breeder-fattener).

The comparison of technical data relating to the economic aspect of cattle farms between the farms proved to be significant ($p < 0.05$).

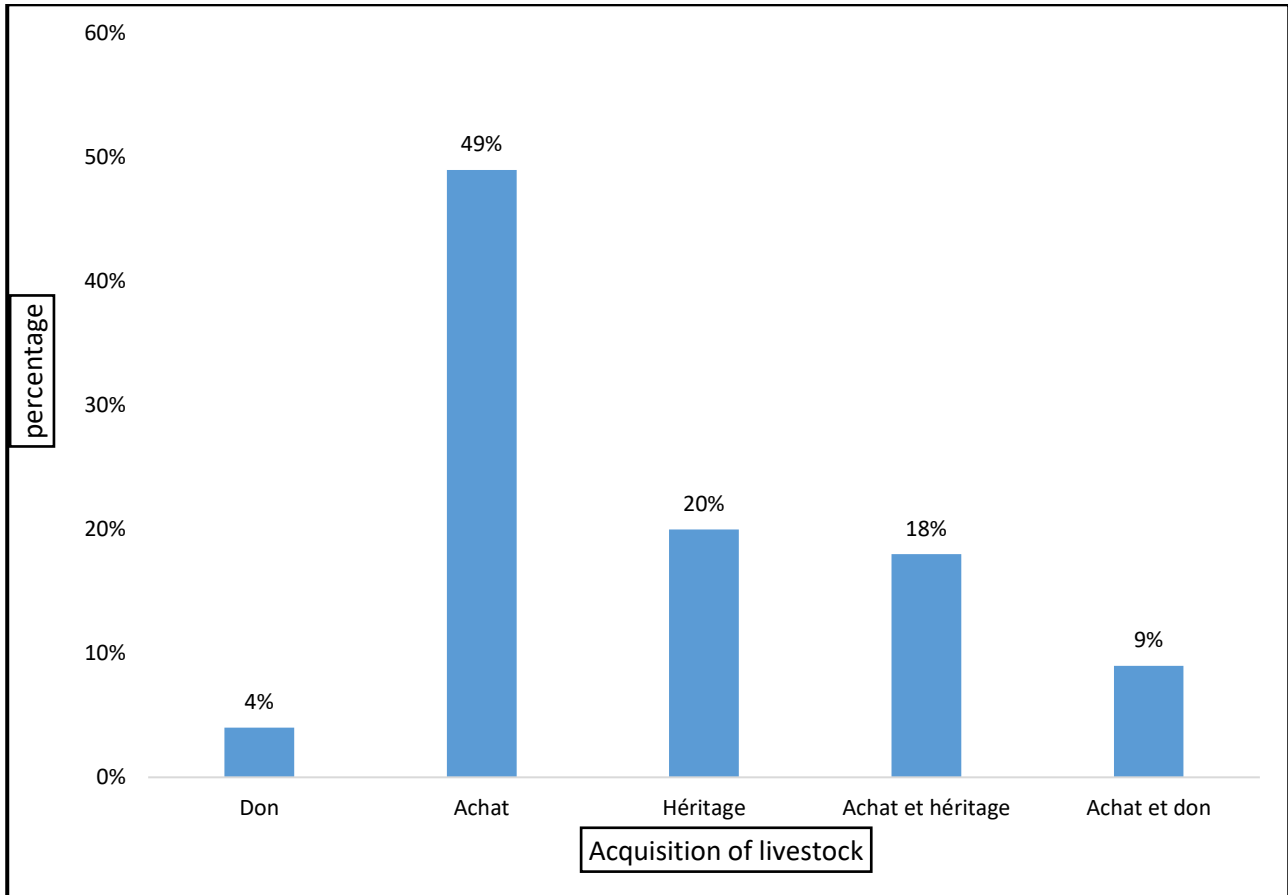


Figure 1: Mode of acquisition of livestock by breeders



Figure 2: Herd of crossbred cattle (N'Dama x Zebu)

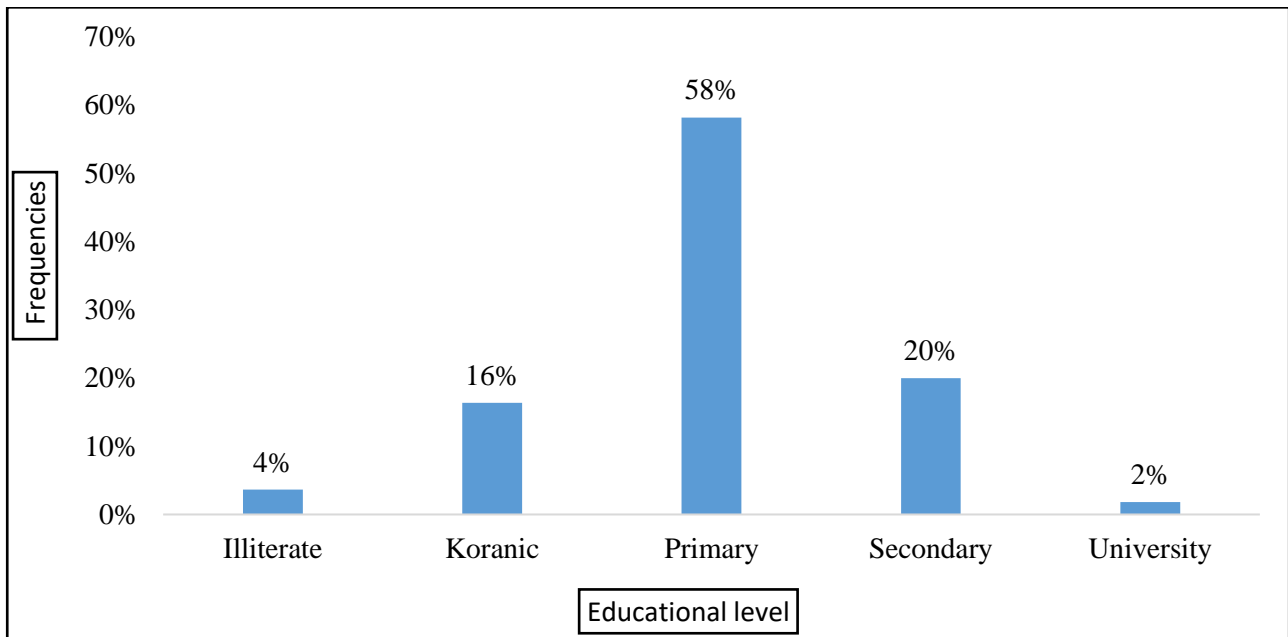


Figure 3: Educational level of cattle breeders

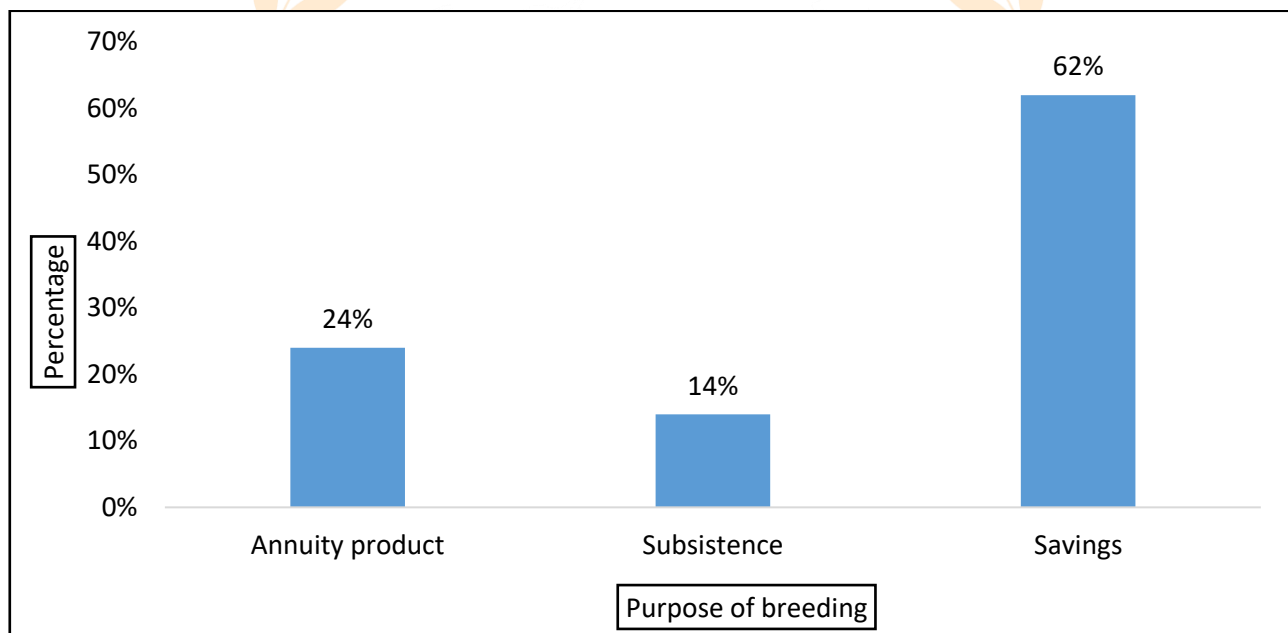


Figure 4: Economic representation of cattle breeding

4- Constraints to livestock development

The constraints to the development of cattle breeding have concerned pathologies, breeding practices, feeding and pasture management.

4.1- Constraints related to feeding and pasture management

Fodder is the staple food of ruminants, and the forage space is becoming increasingly scarce, herdsmen are faced with a saturation of land used largely for cashew cultivation. While conveying the animals, the herdsmen

misbehave. Some of them were distracted, inattentive and the fields were not fenced, crop damage was recorded. This alludes to the thorny problem of farmer-herder conflicts (Figure 5).

4.2- Constraints related to farming practices

For the technical conduct of cattle breeding, breeders due to lack of training or ignorance only stick to their own reasoning. Most breeders do not have the notion of appropriate breeding techniques, nor in technical management and organization of the herd.

Technical documents relating to sanitary and zootechnical registers are not completed. This does not make it possible to calculate the zootechnical parameters for the regular monitoring of the cattle herd. This was observed at the level of 40% of the breeders (Figure 5).

4.3- Constraints related to pathologies

In the region, the most common pathologies in cattle farms are contagious bovine pleuropneumonia commonly known as *djourffor* and foot-and-mouth disease which is currently rife in the region and called *saffa* by breeders.

The latter is a viral disease, characterized by sores on the gums which cause an abundant flow of saliva and sores on the claws cause lameness of the animals. Other diseases such as lumpy skin disease, bovine tuberculosis and internal and external parasitosis have been cited. It must be recognized that 24% of breeders were concerned (Figure 5).

5- Prospects for development

Breeders, aware of the stakes in the animal production sector, wanted to improve zootechnical performance through feeding and pasture management and the eradication of recurring pathologies.

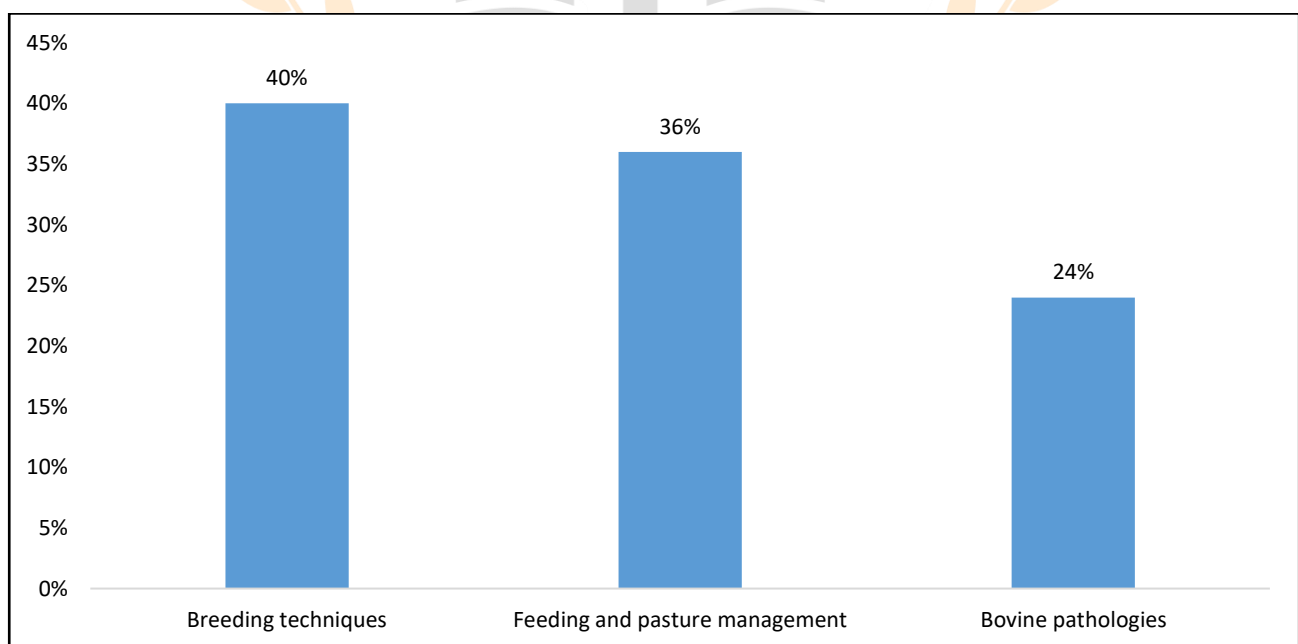


Figure 5: Constraints related to the conduct of cattle breeding

5.1- Prospects for the beef sector

Cattle breeding provides savings and a form of financial guarantee for the breeder. This has been demonstrated by the vivacity of breeders who are not passive actors and are ready to take charge of bringing their animals to market. (Figure 6).

5.2- Prospects for feeding and pasture management

The dry season is a period of livestock food crisis marked by a qualitative and quantitative deficit of fodder. This food deficiency is the cause of the weight loss of animals in the dry season and non-fertile projections with the direct effect of low weight and numerical productivity in traditional farming systems. To increase animal productivity, 36.36% of breeders felt that it was necessary to reduce the fodder and nutritional deficit of the dry season by building up fodder reserves in sufficient quantity and quality (Figure 6).

5.3- Pathology perspectives

Livestock are confronted with a certain number of pathologies, some of which cause very significant economic losses. These pathologies represent a real obstacle to the development of animal production in Côte d'Ivoire. To ensure the well-being and health of populations, it turns out that 23.63% of breeders aspire to actions to be taken such as strengthening the fight against contagious diseases, epidemiological surveillance of priority diseases and monitoring, sanitary facilities close to farms (Figure 6).

DISCUSSION

Cattle breeding is the main activity for 47% of breeders. However, the level of education of the latter is low (60% primary level). The main breeds encountered are crossbreds or hybrids (51% of farms) resulting from crosses between local breeds (N'dama and Baoulé) and Sudanese Fulani zebus. This could be explained by the fact that zebus are large and value poor natural rangelands unlike local breeds. This observation is similar to that of Soro et al. (2015) and Atsé (1990) claiming that farms in the northern region show very significant signs of crossbreeding, in the range of 43 to 57%. A study by Roukayath (2016) in northeast Benin revealed the same results. The same is true for Olorunnisomo (2010) and de Baldet (2011) who estimated that mixed races are clearly predominant, respectively in Oyo State in Nigeria, and in eastern Senegal.

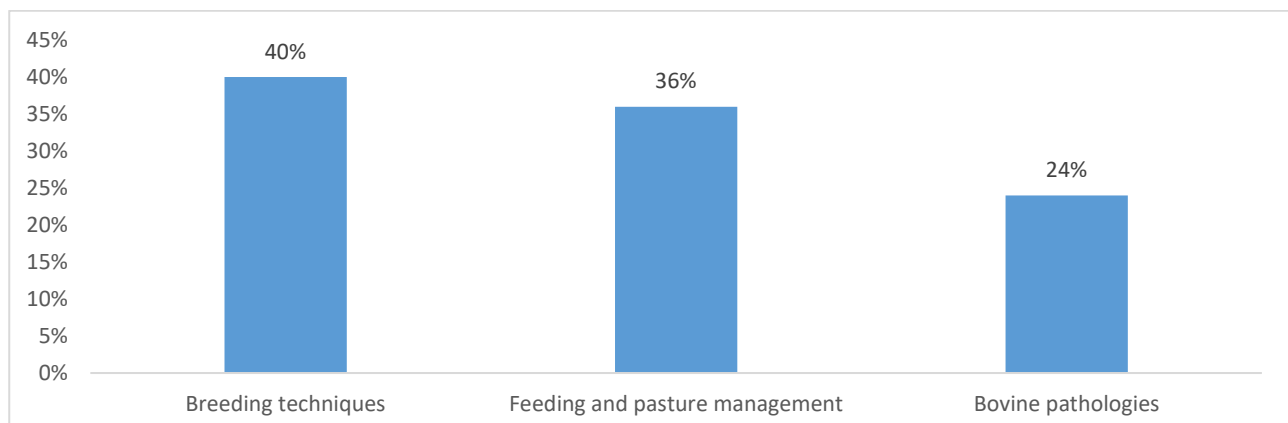


Figure 6: Typologies of prospects for cattle breeding



There are three modes of acquisition of breeding cattle (acquisitions by purchase, gift and inheritance) of which 47% of the cattle were acquired by purchase. These same sources of acquisition of the breeding nucleus were reported by Sokouri (2008) following a survey on the exploitation of cattle in the center and north of Côte d'Ivoire. It should be noted that 62% of breeders practice savings breeding against 24% of commercial breeding and 14% of subsistence breeding. This shows the importance of the economic investment to be made in order to benefit from the income it could generate. According to Bernadet (1984), cattle breeding essentially acts as a means of hoarding and savings. According to Doti (2010), livestock represent a hedge against risk as capital and animals can be exchanged for food in times of deficit. Unfortunately, milk production is a secondary activity and is left to the herdsmen. These results corroborate those obtained by FAO (2016) stipulating that milking is practiced in more than 75% of sedentary herds in northern Côte d'Ivoire and linked to the herding contract.

However, development constraints exist at the level of cattle feeding, production techniques and especially the health status of animals, with the presence of tuberculosis, contagious bovine pleuropneumonia, foot-and-mouth disease and parasitosis. This pathological dominance would be favored by the humid environment where the parasite pressure seems high and favorable to the spread of diseases. This could be explained by farmers' lack of knowledge of certain pathologies and the self-medication practices to which they are firmly attached (Drabo, 2011). Indeed, the dry season is characterized by the lack of pasture and the high prices of food supplements make this period a backbone for herders in the region. As forage space is becoming increasingly scarce, the herdsmen are faced with a saturation of the land used largely for cashew cultivation. In addition, it happens that crop damage and problems of farmer-herder conflicts are reported in places, especially in the dry season.

Most breeders did not practice the notion of appropriate breeding techniques, technical management and organization of the herd. This was noted by the non-use of technical documents relating to sanitary and zootechnical registers for regular monitoring of the cattle herd.

For development prospects, breeders are not passive actors but on the contrary are ready to take charge of the marketing of their animals if they are sure to benefit from it. The challenge today is to be able to give them sufficient negotiating weight with respect to the downstream side of the sector. Indeed, the capitalization of cattle is strong in the village environment. However, the financial system (banking and insurance) remains rudimentary, unreliable and inaccessible for many herders.

CONCLUSION

Farms are essentially traditional and sedentary types whose staple food remains natural pasture in the Denguélé District. The cattle herd is made up of 51% cross breeds (Zébu x N'dama) of which 47% of the farms were acquired by purchase. It has an economic interest in society (62% of farms) and acts as a means of hoarding and savings for breeders. However, major constraints are hampering the harmonious development of this cattle breeding in the district. They concerned pathologies (tuberculosis, contagious bovine pleuropneumonia, foot-and-mouth disease and parasitosis), problems of management of natural pasture and the technical skills of breeders. It is important that state structures support breeders to strengthen the fight against these bovine diseases to improve the income of breeders.

THANKS

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STATEMENT OF AUTHORS' CONTRIBUTIONS

The study and writing of the manuscript were carried out in a collegial manner. Nevertheless, according to the following steps, NBA and GKGB participated in the design and planning of the study. NBA and FC collected the data and wrote the first draft of the manuscript. GKGB, NS and NBA performed the statistical analyzes and interpretation of the data. FC, NS performed the critical review of the manuscript.

CONFLICTS OF INTEREST

The study was carried out without conflict of interest.

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