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## RESEARCH ARTICLE

### ANALYSIS OF PRODUCTION AND MARKETING WITHOUT PACKAGING OF FRESH COW'S MILK IN THE CITY OF KORHOGO

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#### ABSTRACT

A study was carried out in the town of Korhogo, the general objective of which is to contribute to improving the production of fresh cow's milk in the locality. The snowball method was used to carry out the survey. It appears that 40 actors including 35% producers, 12.5% collectors and 52.5% traders were investigated. Indeed, the socio-demographic profile of these actors showed that 50% of the producers were illiterate, including 42.86% of Ivorian nationality. Concerning the collectors, the majority (80%) were of Malian origin and illiterate. The same goes for retail traders, 52.38% of whom were Malian and 76.19% illiterate. It should be noted that 85.71% of breeders had zebu breed cattle within their herds while 42.86% had crossbreeds. The average number of cattle per park was  $42.79 \pm 24.34$  head. The production system was extensive with the use of natural forage ranges. Milk production is low with 42.9% of farms producing 12 to 25 liters of milk per day while 35.7% of farms produced less than 8 liters. The marketing of fresh milk was done in detail by traders and the majority (52.3%) of them sold 10 to 30 liters per day. Milk production in the town of Korhogo remains informal.

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## INTRODUCTION

The dairy sector has experienced sustained development for several decades, with extremely heterogeneous production models from one geographical area to another depending in particular on the variety of pedoclimatic conditions (Sraïri et al., 2019). In West Africa, milk production is experiencing very variable increases in all member countries. The weight of dairy farming in the agricultural economy varies greatly and milk is recognized, in certain countries, as an important element of pastoral populations. Beyond its strict economic value, it also has a strong social and cultural value (Corniaux and Duteurtre, 2018). Milk production amounted to 5.8 billion liters in 2017, of which 61% came from cows, 19% from goats, 12% from sheep and 7% from camels (Chatellier, 2020). However, the development of dairy production in West Africa, including Ivory Coast, faces numerous territorial, genetic, food, rainfed, economic and commercial difficulties (Corniaux and Duteurtre, 2018).

milk production due to the diversity of animal species concerned, self-consumption, local sales and the poor structuring of the statistical system, very little data has been produced in this sector (International Dairy Federation, 2018). However, to improve milk production, knowledge and continuous monitoring are essential. This would provide up-to-date data that would guide decision-making for better production. It is in this context that this study was carried out in the North of the country, the general objective of which was to contribute to the improvement of the production of fresh cow's milk in the town of Korhogo.

## MATERIAL AND METHODS

### Material

**Biological material:** The biological material consists mainly of milk from cattle herds on local farms sold in the town of Korhogo. These are zebus, mongrels and bullocks. Only fresh milk sold by producers and retail traders within the town of Korhogo from cattle farms was taken into account in this study.

**Target population:** This investigation focused on fresh milk producers in the town of Korhogo, fresh milk retail traders and collectors who supplied the town's markets as part of the marketing of fresh cattle milk.

**Technical equipment:** The technical material consisted of survey sheets to collect information relating to the socio-demographic profile of producers, the dairy production system and the marketing of cow's milk; computer for entering the technical data collected; a blouse, muffler and pair of boots for individual protection measures. It also consisted of cans of different capacities distributed to the different stakeholders to quantify the milk.

## Methods

**Sampling:** The sampling used is the non-probabilistic method based on the snowball technique. Indeed, not having a list of producers and retailers of fresh milk, this method consists of determining the position of another person to be investigated using information from a first person already investigated.

## Investigation

**Pre-survey:** This pre-survey made it possible to select the sites to be the subject of our study. It took place in the town of Korhogo in the north of Ivory Coast. This phase took place from February 15 to March 13, 2023 in several districts of the city of Korhogo. This meeting made it possible to make contact with the different stakeholders but also made it possible to improve the questionnaire.

**Investigation itself:** The survey itself was carried out from March 20 to June 5, 2023 using a questionnaire administered in the form of a direct interview and made it possible to collect data relating to actors, farms, marketing and the profitability of the activity. For better organization, the collection of data relating to production and marketing was done twice a week for each actor.

**Data processing:** At the end of the surveys, manual processing of the questionnaires was carried out. This work made it possible to process data relating to the socio-demographic profiles of the actors, the characteristics of the agricultural holdings, the marketing system for locally produced milk and the evaluation of the profitability of the activity with Excel software.

## RESULTS

**Location and number of actors:** The results reveal a workforce of 40 identified actors including 35% producers, 12.5% collectors and 52.5% Retail traders. These actors had spread to several districts of the city of Korhogo (table 1).

**Socio-demographic profile of actors:** The socio-demographic profile of the actors is established in Table II. The producers were mainly of Ivorian nationality (42.86%). However, a significant proportion (35.71%) were of Malian nationality compared to 21.43% of Burkinabe nationality. As for the collectors, the vast majority (80%) were of Malian origin and the rest (20%) were Burkinabés. The majority of retail traders were foreigners with 52.38% Malian and

33.33% Burkinabé. Ivorian women were in the minority with a percentage of 14.28%. Regarding ethnicity, the Peuhl was the dominant ethnic group (57.14%) at the producer level followed by the Senoufo (28.57%). The collectors were all Fulani. As for retail traders (Shopkeepers), 85.71% were Peuhls compared to 14.28% Senoufos. In terms of education, the majority of producers were illiterate (50%); 14.2% had a primary level and 28.57% a secondary level of education. Concerning the collectors, 80% of them were illiterate and 20% had a primary education. As for retail traders, the majority (76.19%) were illiterate while 14.29% had a secondary level.

**Characteristics of farms:** Table III below presents the characteristics of cattle farms in the study area. All the farms visited only had night pens. The feeders and drinkers used were mainly (71.43%) made of rubber compared to 21% made of cement and 7.14% made of wood. Regarding the breeds raised, the zebu was the most exploited breed (85.71%). As for the mixed race, it was found in 42.86% of the farms, on the other hand the taurine breed is exploited by 7.14% of the farms. Approximately, 42.86% of the farms had a herd of less than 30 heads and the average number of cattle per park was  $42.79 \pm 24.34$  animals. All the farms encountered fed the animals on natural forage. Among these, 57.14% used food supplements such as oilcake, bran or harvest residues. During the dry season, 71.43% of producers used traditional wells to water their livestock while 7.14% opted for tap water. On the other hand, during the rainy period, all the herds watered in the surrounding streams. Regarding milk production, 42.9% of farms produced quantities between 12 and 25 liters per day while 35.7% of farms produced less than 8 liters.

## Milk trade

**Milk supply method and quantities sold:** The majority of retail traders (85.71%) obtained their milk supplies from city collectors. On the other hand, 14.28% obtained their supplies through the SCOOP CA Profilait dairy (Cooperative Society Board of Directors of Professionals in the dairy sector) (Table IV). According to the results of the survey, the majority of traders (52.3%) sold 10 to 30 liters per day while 14.3% sold 60 to 80 liters of milk per day. A significant portion (23.8%) sold between 30 and 60 liters of milk per day.

**Milk purchase and sale prices depending on the seasons:** In the dry season, producers sold a liter of milk at 600 FCFA, while during the rainy season, the price of a liter dropped to 500 FCFA. Collectors bought a liter of milk at 350 F in the dry season, while in the rainy season, the price varied between 250 FCFA and 350 FCFA. Thus, in the dry season, they sold the liter of milk at 450 FCFA and at 400 FCFA in the rainy season. As for retail traders, they bought a liter of milk at 450 FCFA in the dry season or 400 FCFA in the rainy season. Whatever the purchase price, they resold the liter of milk at a fixed price of 600 FCFA. The Union SCOOP CA Profilait dairy bought a liter of milk for 350 FCFA, regardless of the season. Its selling price was 400 FCFA or 600 FCFA (Table V).

**Circuit de commercialization:** Urban producers sold their milk production directly to consumers, either through their spouse or child, or by selling the milk directly on the farm. At the same time, collectors went outside the city to buy milk from local producers due to the favorable price. Once

acquired, the milk was resold by these collectors to retail traders. The traders, for their part, obtained the milk from collectors or from the SCOOP CA Profilait dairy.

Once in possession of the milk, the retail traders then resold it to consumers. As for the SCOOP CA Profilait, which had a dairy to its credit, it brought together three producers' cooperatives, a collectors' cooperative and a traders' cooperative. This dairy obtained milk directly from cooperating producers through cooperating collectors. Subsequently, she resold the milk to both cooperating traders and consumers. However, for non-cooperators, the SCOOP CA Profilait dairy applied a higher price per liter of milk (Figure 1).

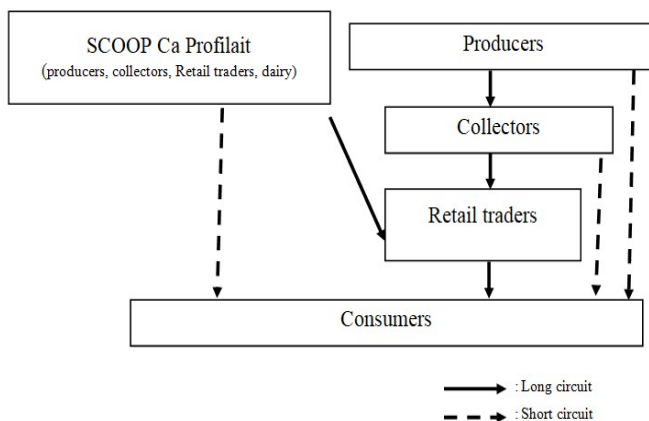


Figure 1. Marketing circuit

Table I. Location and number of actors

Actors	Locations	Number	Total	Pourcentage
Breeders	Kassirimé	2	14	35 %
	Natio	5		
	Wahonvogo	3		
	Mongaha	1		
	Residentiel 3	2		
	Teguere extension	1		
Retail traders	Kassirimé	5	21	52,5 %
	Natio	1		
	CocodyBiâte	1		
	Boribana	1		
	Soba	1		
	Koko	2		
	Nouveau quartier	1		
	Wahonvogo	1		
	Banaforo	2		
	Sozoribougou	2		
	Residentiel 3	2		
	Ahoussabougou	2		
Collectors			5	12,5%

## DISCUSSION

In the present study, the production and marketing of fresh cow's milk in the town of Korhogo were examined. The results obtained provide valuable information on the characteristics of local dairy production as well as the

marketing system in place. Thus, the socio-demographic profile presented a predominance of producers of the Peuhl ethnic group (57.14%). This same analysis was done by Hamadou et al. (2003) in the peri-urban area of Bobo-Dioulasso. In this region, producers of the Peuhl ethnic group dominate with 87.13%. This high proportion of Fulani could be explained by the fact that livestock breeding is a cultural activity for this ethnic group. These producers have a high level of illiteracy (50%). This is due to the fact that breeding is an activity that is passed down from father to son and these breeders do not consider it necessary to do any training to get started in cattle breeding. Our results agree with those of N'Diaye (2006), who found in Senegal that the majority (52%) of producers were illiterate compared to 48% who had studied.

Concerning the facilities of the livestock farms visited, several reasons can be put forward to justify the situation of the village parks. In addition to the lack of money for larger investments in the parks, it is possible that producers want to adapt these parks to traditional practices by favoring the surveillance and protection of the animals. Indeed, village parks offer more practical and economical management of livestock. Also, the sedentary lifestyle of different livestock can also influence the choice of facilities. These results are different from those of Castel (2004) who stated that in Ethiopia the livestock live in stables. The almost total presence of zebu in the surveyed farms (85.71%) can be explained by the butchery characteristics of the zebu which make it a prized breed for meat production, thus responding to growing market demand.

The presence of the mixed race at 42.86% suggests a desire of producers to diversify their activities and turn to dairy production. These results are different from those of Sokouri et al. (2009) who highlighted that zebu were less numerous in the northern region and represented only 8% of the herd. The average number (43 heads) obtained was higher than that found by Vias et al. (2003) in Mali which was 27 cattle. This could be justified by the fact that the North of the country is the area which concentrated the majority of cattle breeding. The low milk production reported by producers during the dry season can be explained by several factors including that relating to the reduction in the quantity and quality of fodder available during this period. Additionally, grazing distance could also play a role, making access to pasture more difficult for cows.

From the 240 lactating cows, a total of 177 liters of milk was collected, representing on average 0.74 liters per cow. These results indicate a higher average daily production than that reported by Akaffou (2013), who found that producers obtained less than 0.5 liters of milk per cow in the dry season. However, the results of Bonfoh et al. (2007) showed daily quantities varying between 0.5 and 3.5 liters per cow. These variations can be attributed to several factors, such as the breeds of cows present, the breeding practices implemented and the environmental conditions. Grazing as the primary mode of feeding livestock is a key feature of the extensive production system. It plays a fundamental role in the profitability of this system, in accordance with the observations made by Marichatou et al. (2003) concerning extensive production systems.

Table II. Socio-demographic profile of the actors

Parameters		Breeders	Collectors	Shopkeepers détaillantes
Nationality	Ivoirian	42,86%	0	14,28%
	Malian	35,71%	80%	52,38%
Ethnic group	Burkinabe	21,43%	20%	33,33%
	Senoufo	28,57%	0	14,28%
	Peuhl	57,14%	100%	85,71%
	Malinke	14,29%	0	0
Educational level	Primary school	14,28%	20%	9,52%
	Secondary school	28,57%	0	14,29%
	University	7,14%	0	0
	Illiterate	50%	80%	76,19%

Table III: Répartition des exploitations selon la nature des installations et équipements d'élevage

Characteristics		Proportion (%)
Nature of facilities	Village park	100
	Modern park	0
Nature of breeding equipment	Rubber	71,43
	Cement	7,14
	Wood	21%
Breeds	Metis	42,86
	Zebus	85,71
	Taurine	7,14
Livestock composition	Less than 20 heads	21,43
	From 20 à 30 heads	21,43
	From 40 à 50 heads	7,14
	From 50 à 60 heads	14,29
	From 60 à 70 heads	21,43
Dietary supplement	70 heads and more	14,29
	Yes	57,14
Water source	No	42,86
	Borehole water	21,43
Milk production per farm per day (l)	Well water	71,43
	Tap water	7,14
	Less than 8	35,70
	From 8 to 12	21,40
	From to 25	42,90

Table IV: Milk supply method and quantities sold

	Numbers	Proportion (%)
Supply method	Collecteurs	85,71
	Union Scoop Dairy It profiled	14,28
Quantity sold per day (l)	Less than 10	4,8
	From 10 to 30	52,3
	From 30 to 60	23,8
	From 60 to 80	14,3

Table V: Milk purchase and sale prices depending on the seasons

Actors	Dry season		Rainy season	
	Purchase price (FCFA)	Selling price (FCFA)	Purchase price (FCFA)	Selling price (FCFA)
Producers		600		500
Collectors	350	450	250-300	400
Retail traders	450	600	400	600

This means that the availability of quality pasture is essential to ensure adequate livestock nutrition and promote good yields. However, it is interesting to note that 57.14% of producers used feed supplements for their livestock. This practice could be explained by producers' awareness of the importance of providing food supplements to improve animal performance. According to the results of the survey, the majority of traders (52.3%) obtained their supplies of fresh milk through city collectors who collected milk from breeders. This follows a pattern established for a long time to which the various actors should conform. In their study Dia et al. (2009) mentioned that collection was carried out by collectors equipped with more or less rudimentary equipment (plastic cans) and who used bicycles, mopeds or donkey or horse carts as means of transporting milk from production areas to processing units. However, the same authors mention several collection systems which have developed to supply artisanal mini dairies in several countries (Senegal, Mali, Burkina Faso, etc.). This multitude of circuits makes the circuit complex and informal. According to Penot et al. (2012) in Madagascar, the milk marketing circuit in Africa is not uniform and has several variants which actually make it more complex than it seems.

## CONCLUSION

At the end of this study, it appears that the town of Korhogo has low milk production. The livestock sector is dominated by mostly illiterate Fulani of various nationalities. The majority of producers use village parks with rudimentary breeding equipment, exploit natural grazing and the zebu or mongrel breed. It is essential to note that the Korhogo cattle herd is mainly composed of non-dairy cows. Milk is mainly marketed at retail by traders who are integrated into marketing circuits.

## CONFLICT OF INTERESTS

The authors declare that there are no conflicts of interests associated with this article.

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