Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Milk, stigma, and the material politics of purity: quality, hierarchy, and pastoral inequality among Fulbe and Mbororo in Adamaoua, Cameroon

Hamidou Hamidou

hamidou@niku.no

Norwegian Institute for Cultural Heritage Research

Marius Warg Næss

Norwegian Institute for Cultural Heritage Research

Research Article

Keywords: pastoralism, milk quality, Fulbe-Mbororo relations, ethnic hierarchy, foodscape

Posted Date: November 19th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11373800/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Abstract

This article examines how ethnic hierarchies between Fulbe and Mbororo pastoralists in Cameroon's Adamaoua region are reproduced and reconfigured through milk, purity, and quality. Moving beyond accounts that focus primarily on the political and legal marginalization of Mbororo groups, it treats milk as a material and symbolic medium through which ethnic boundaries are enacted, contested, and naturalized. Drawing on ethnographic fieldwork that combines participant observation, semi-structured interviews, and visual documentation, the article shows that some Fulbe milk vendors, processors, and consumers associate milk from mobile Mbororo producers with impurity, poor hygiene, and unreliable quality, while linking more settled, organized dairy practices to cleanliness, regularity, and modernity. These judgments cannot be reduced to technical assessments: although hygiene vulnerabilities are materially real across the regional dairy chain, concerns about handling, storage, and transport may be selectively attached to Mbororo producers and mobility. Such classifications shape trust, sourcing decisions, pricing, and access to emerging dairy value chains. Drawing on scholarship on purity, stigma, distinction, and quality governance, this article argues that, in Adamaoua's changing dairy sector, material concerns about milk hygiene and quality become entangled with historically grounded judgments about mobility, respectability, and ethnic belonging. Although milk-quality risks are real and affect the dairy chain more broadly, actors may selectively attach these concerns to milk associated with mobile Mbororo producers. Dairy infrastructures and quality regimes therefore shape not only technical compliance but also trust, market access, and unequal recognition among pastoral actors.

Introduction

Transformations in pastoral systems across sub-Saharan Africa have reshaped social relations, economic practices, and inequality within communities. Far from being static or isolated ways of life, pastoral systems are increasingly shaped by market integration, sedentarization, territorial fragmentation, commercialization, and expanding state and development interventions. These processes create differentiated opportunities and constraints, contributing to growing social and economic differentiation among pastoral households and groups (Catley et al., 2013; Moritz et al., 2025; Schareika et al., 2021).

Across West and Central Africa, pastoral societies have long been characterized by internal hierarchies in which status, wealth, mobility, political incorporation, and symbolic legitimacy shape relations among differently positioned groups. Among the Fulbe—often referred to as Fulani in anglophone scholarship—research has highlighted historically constituted distinctions between politically incorporated and relatively settled groups, including elite or "noble" lineages in some contexts, and more mobile pastoral groups such as the Mbororo. These distinctions reflect not only contrasting livelihood strategies but also unequal relations of authority, belonging, and access to resources (Azarya, 1996; Burnham, 1996).

Ethnographic descriptions have often cast Mbororo pastoralists as an internal other within the broader Fulbe social world. Bocquené and Ndoudi (1986, p. 309), for example, describe Mbororo groups as living

in continual movement and lacking stable territorial anchorage, using the terms *dilla-warta'en* or *eggahodda'en*—"foreigners everywhere"—to characterize their association with cattle and the bush. While such descriptions capture important dimensions of pastoral mobility, they may also reproduce a social imaginary in which Mbororo mobility signifies distance from dominant political, territorial, and moral orders. Mobility thus becomes not only an economic practice but also a marker through which people interpret alterity and marginality.

Studies of Cameroon show that these representations have tangible consequences. Mbororo pastoralists are often portrayed as "backward," insufficiently civilized, or external to state institutions, which constrains their access to land, public services, political representation, and economic opportunities (Pelican, 2015; Pelican & Mimche, 2012). Azarya's (1996) comparative analysis further shows that centralized political systems dominated by settled, state-linked Fulbe aristocracies often subordinated mobile pastoralists. Whereas politically incorporated elites exercised greater control over office, taxation, and access to resources, mobile groups were less represented and more vulnerable to exclusion. In this context, mobility became a basis for unequal political incorporation rather than simply a mode of livestock production.

Although scholarship on state formation, legal exclusion, and identity politics has shown how ethnic and intra-ethnic hierarchies are reproduced, it has paid less attention to the everyday material practices through which these hierarchies are enacted, stabilized, and contested. This article addresses this gap by examining milk circulation and dairy infrastructure in Adamaoua, Cameroon, including milking and handling practices, hygiene and quality assessments, storage and processing technologies, veterinary interventions, cooperative marketing, and household labor. These seemingly ordinary practices are consequential sites where gendered authority, distinctions among pastoral groups, claims to respectability, and access to dairy modernization are negotiated.

The milk sector in Cameroon

Livestock keeping is central to rural livelihoods and food systems in Cameroon, particularly in the northern regions and Adamaoua, where ecological conditions have long supported cattle production (H. C. Edima et al., 2021). Agriculture and livestock farming employ a substantial share of the country's active population, and many rural households depend directly on cattle for food, income, social security, and reproductive continuity (Kouamo & Pa-ana, 2017; Oussoumanou et al., 2025). For pastoral households, milk is not merely a commodity: before it enters commercial circuits, households commonly allocate it to calves, household consumption, and care and reciprocity (Boutrais, 2005, pp. 413–415).

Despite a national cattle population estimated at 8.5 to 9 million head, domestic dairy production remains relatively low. Most production occurs in extensive or semi-extensive systems, whereas intensive and semi-intensive systems account for a small share of total output (Kouamo & Oumarou, 2026; Provost et al., 2022). Local cattle breeds typically yield one to three liters of milk per cow per day. Seasonal shortages of forage and water, heat stress, animal disease, limited veterinary services,

dispersed production sites, and inadequate collection, transport, and cooling facilities constrain production (Bayemi et al., 2005; Kouamo & Pa-ana, 2017; Nchinda et al., 2025).

The gap between domestic production and national demand has made dairy development a policy priority. In 2023, Cameroon's domestic production was estimated at 176,618 tonnes, compared with national consumption of approximately 353,675 tonnes; imports therefore remain important for meeting demand (MINEPIA, 2023, 2025; Nchinda et al., 2025). In 2023, the country imported 20,596 tonnes of milk and dairy products, valued at approximately CFA 40.6 billion (about EUR 61,894,302), including 17,217 tonnes of powdered and concentrated milk (Kouamo & Oumarou, 2026). State agencies, development projects, and private enterprises have responded by promoting improved and crossbred cattle, artificial insemination, veterinary inputs, collection centers, processing facilities, and commercial dairy farms (Kouamo & Oumarou, 2026). These initiatives aim to increase both the volume and the quality of locally produced milk.

Adamaoua is central to these transformations. The region is a major cattle- and milk-producing area, and collection systems, dairy cooperatives, private processing enterprises, veterinary services, and initiatives promoting improved dairy breeds have expanded (H. Edima et al., 2013, 2014; H. C. Edima et al., 2021; Njeufa et al., 2021). Yet the material conditions of milk production and circulation remain uneven. A 2011–2012 study around Ngaoundéré found that contamination increased as milk passed through producers' containers and during collection, transport, and delivery to processing facilities. The study identified rudimentary milking practices, inadequately cleaned containers, prolonged transport at ambient temperatures, and the absence of a cold chain as key constraints on milk quality (H. Edima et al., 2013, pp. 341–342).

Importantly, Edima, Awono, and Ndjouenkeu's (2013) study does not compare milk quality by producers' ethnic affiliation. Instead, it identifies critical contamination points across the dairy chain, pinpointing hygienic vulnerabilities in handling practices, equipment, transport, and infrastructure rather than in producers' presumed identity. This distinction is central to the present article. Although quality and hygiene concerns have a material basis, the ethnographic analysis below examines how broader structural problems in collection, storage, transport, and refrigeration may become selectively associated with milk from mobile Mbororo producers.

The shift toward more standardized dairy production creates new criteria for commercial legitimacy. Hygiene, cold storage, a reliable supply, veterinary monitoring, processing equipment, packaging, traceability, and technical expertise can signal reliable, "modern" production. However, access to these resources is uneven. Actors with capital, fixed infrastructure, stable market connections, and institutional support are generally better positioned to meet emerging standards than pastoral households whose production remains partly organized through mobility and seasonal transhumance. Such inequalities should not be interpreted as evidence of a linear decline in pastoralism. In the Far North of Cameroon, for example, peri-urban Fulbe pastoralists have combined purchased dry-season feed with continued

transhumance and, by entrusting cattle to mobile herders, have integrated intensive and extensive strategies in response to shrinking rangelands (Moritz, 2008).

In Adamaoua, the growing dairy economy is neither simply “traditional” nor fully modernized. Milk remains embedded in household reproduction, calf rearing, gendered labor, social relations, and pastoral moral economies, even as it enters expanding markets and quality-governance regimes (Bierschenk & Le Meur, 1997; Corniaux et al., 2014; De Bruijn, 1997, pp. 63–76; Sadler et al., 2010). At the same time, historically rooted distinctions between more politically incorporated Fulbe groups and marginalized Mbororo pastoralists shape unequal access to land, services, markets, and development interventions (Azarya, 1978, 1993, 1996; De Vries, 2020; Hickey, 2007; Pelican, 2008, 2012; Pelican & Mimche, 2012). The question is therefore not only whether dairy modernization improves milk quality or raises production. It is also how its technical languages, infrastructures, and standards reshape who is recognized as a legitimate producer of clean, reliable, and valuable milk.

Theoretical approach

This article synthesizes scholarship on purity and pollution, symbolic distinction, and the social construction of quality to examine how milk functions as a medium for negotiating ethnic hierarchy, market legitimacy, and pastoral modernity in Adamaoua.

Anthropological scholarship on food has long shown that although eating is indispensable to biological survival, food practices are not determined solely by biological necessity. The production, preparation, distribution, and consumption of food help constitute social relations, gendered authority, status distinctions, moral evaluations, and symbolic boundaries (Appadurai, 1986; Bourdieu, 1984; Douglas, 2003; Goody, 1982; Mintz, 1985). Milk should therefore be understood not only as nourishment or a marketable product but also as a material substance through which pastoral households negotiate care, hospitality, household reproduction, respectability, and belonging.

Douglas’s (2003) analysis of purity and pollution offers a first analytical lens. For Douglas (2003), distinctions between purity and impurity reflect broader efforts to maintain social order and protect classificatory boundaries. Food classifications are not reducible to nutrition or biomedical hygiene; they are part of a “… systematic ordering and classification of matter …” (Douglas, 2003, p. 36). Her formulation of dirt as “… matter out of place” (Douglas, 2003, p. 41) highlights how substances, persons, and practices may seem troubling when they appear to transgress established systems of order. As she writes, reflection on dirt is also reflection on “… the relation of order to disorder” (Douglas, 2003, p. 5).

Substances or practices that fall outside these classificatory schemes—what Douglas (2003) treats as ambiguous or anomalous—are likely to be perceived as dangerous or polluting. In Fulbe pastoral contexts, milk has long been interpreted, in Douglasian terms, as a “pure” substance embedded in moral codes and social relations, circulating through kinship networks and reinforcing social cohesion. By contrast, what lies outside such systems—milk handled by the “wrong” people, produced under “improper” conditions, or routed through unfamiliar channels—risks being reclassified as improper or

polluting. This perspective offers a powerful lens for understanding why some Fulbe vendors and dairy-bar owners sometimes describe milk sourced from Mbororo households as “dirty” or “impure” and how such framings carry moral weight.

Applied to milk, this perspective highlights the moral and relational conditions under which a substance is recognized as clean, proper, safe, or trustworthy. Rather than assuming that impurity is a self-evident material property, the analysis asks how judgments about milk handling, producers’ identities, mobility, containers, and marketing channels become linked to broader distinctions between legitimate and suspect forms of pastoral practice. This does not imply that hygiene concerns are merely symbolic or that microbiological risks are unreal. Rather, it allows us to examine how technically meaningful concerns about handling, storage, transport, and contamination may take on additional moral and ethnic significance in everyday evaluations of milk.

Bourdieu’s (1984) theory of distinction further situates these classifications within relations of symbolic power. For Bourdieu, taste is not merely an individual preference but a socially constituted disposition shaped by unequal access to economic, cultural, and social resources. As he puts it, “taste classifies, and it classifies the classifier” (Bourdieu, 1984, p. 6). Taste both expresses and reproduces social positions by establishing distinctions among what is perceived as legitimate or illegitimate, refined or vulgar, and respectable or disreputable.

Grounded in *habitus*—durable, embodied dispositions that orient practice—these distinctions may seem self-evident to those who enact them. Taste contributes to a “… sense of one’s place …” in social space (Bourdieu, 1984, p. 473) while also operating through distaste, disgust, and intolerance toward others’ practices (Bourdieu, 1984, p. 49). In the dairy sector, judgments about “clean,” “dirty,” “watered,” “reliable,” or “modern” milk may therefore do more than describe material properties. They may also distinguish among producers, production systems, and ways of life, assigning greater legitimacy to some practices and devaluing others.

The framework helps us examine whether and how unequal access to infrastructure, technical expertise, and formal market arrangements becomes associated with ethnic identity, mobility, and market legitimacy. It asks whether and how dairy practices associated with regular supply, refrigeration, organized collection, veterinary supervision, processing, and packaging gain legitimacy or are treated as “modern” production. It also asks how unequal capacity to meet these expectations may become linked to social identity, mobility, gender, and access to resources.

Work on foodscapes, market devices, and quality governance adds a third dimension to this analysis. Food is not only consumed; it is also valued, classified, marketed, and governed through infrastructures, expert knowledge, standards, and institutional arrangements. Johnston and Baumann (2014, p. 3) describe foodscapes as dynamic social constructions linking cultural discourse and political economy. In this article, the term *milkscape* refers to the assemblage of social relations, infrastructures, moral evaluations, technical practices, and market arrangements through which milk circulates as a subsistence good, a commodity, and a marker of distinction.

Studies of market devices likewise show that qualities are not simply inherent in goods. Markets rely on material and discursive arrangements that identify, stabilize, and render qualities visible to buyers and sellers (Muniesa et al., 2007, p. 2). In agro-food systems, standards, certification, traceability, laboratory testing, packaging, and quality-control procedures do not merely record pre-existing differences; they help produce what counts as a reliable, safe, or valuable product. Ponte and Gibbon (2005, p. 6) emphasize that quality has no universal or purely technical meaning. Intersubjective, normative, and institutional conventions shape it and are embedded in wider relations of power.

This perspective matters in Adamaoua, where improved containers, refrigeration, veterinary monitoring, cooperative organization, processing technologies, and formal quality procedures are increasingly critical to dairy production and marketing. Access to these resources is uneven and may advantage actors with capital, stable infrastructure, institutional connections, and regular market outlets. The analytical task, therefore, is not to oppose "technical" quality to "moral" evaluation. Rather, it examines how technical standards, material infrastructures, and existing social hierarchies become entangled in the practical definition of clean, safe, reliable, and marketable milk.

Together, these approaches enable the article to examine how milk quality is simultaneously material, moral, and political. They make it possible to analyze how hygienic risks and infrastructural constraints are assessed in practice, how milk becomes associated with producers and forms of pastoralism, and how the capacity to define and demonstrate quality affects trust, pricing, recognition, and access to dairy markets.

Bringing these strands together, this article argues that milk has become a key site where historically grounded moral regimes of purity and distinction are translated into technical idioms of "quality" and "hygiene." Rather than simply replacing earlier classificatory logics, emerging dairy standards, infrastructures, and expert practices may rework them within institutional, scientific, and commercial frameworks. These processes shape unequal opportunities for recognition, market participation, and inclusion in the dairy sector.

The article examines how Fulbe–Mbororo hierarchies are produced, negotiated, and reconfigured through everyday dairy practices and milk-quality evaluations in Adamaoua. It treats marginalization not as a fixed condition but as a process enacted through ordinary activities such as milking, transporting, storing, processing, selling, and assessing milk. In some local commercial settings, milk associated with Mbororo producers is described as "unsanitary," "impure," or "backward." In contrast, dairy practices associated with organized Fulbe suppliers are more readily linked to cleanliness, regularity, discipline, and "modern" production. These judgments do not establish that milk from Mbororo producers is inherently less hygienic or of lower material quality. Rather, they shape relations of trust, sourcing decisions, market transactions, pricing, and access to emerging dairy value chains.

This article makes three contributions. First, it demonstrates that Fulbe–Mbororo hierarchies are materially enacted through the handling, circulation, and evaluation of milk, not only through formal politics, land relations, or legal exclusion. Second, it extends studies on purity, stigma, and distinction by

showing how moral classifications of “clean” and “dirty” milk may be translated and reconfigured within technical regimes of hygiene, quality assessment, veterinary expertise, and dairy standardization. Third, it contributes to debates on pastoral marginalization and agrarian change by examining how quality regimes can function as forms of symbolic power: they shape which forms of knowledge, infrastructure, and practice are recognized as legitimate and reorganize trust, prices, and access to dairy markets in ways that may reproduce existing inequalities.

In this article, “milk quality” encompasses both material characteristics and safety concerns related to handling, storage, transport, and processing, as well as the social judgments by which milk is deemed clean, reliable, or marketable. “Stigma” denotes the negative attribution of impurity, unreliability, or backwardness to specific producers and their products, undermining trust and market access. The analysis uses “purity” and “distinction” to examine how those risks can acquire moral and ethnic significance when linked to forms of mobility, production, and belonging. We borrow the concept of foodscape from Johnston & Baumann (2014), who define it as a culturally structured sphere encompassing social actors’ food traditions and the political economy (Johnston & Baumann, 2014, pp. 2–5). At the same time, we introduce the term *milkscape* to denote the network of relations, infrastructures, institutions, technical practices, and moral evaluations through which milk circulates in Adamaoua. This concept helps analyze milk simultaneously as a substance of household reproduction, a commodity, an object of technical regulation, and a medium of social distinction. In this *milkscape*, quality is not simply an inherent property of milk; rather, producers, collectors, processors, vendors, consumers, veterinary personnel, development actors, equipment, standards, and market infrastructures produce and recognize it through their interactions.

Methods

Fieldwork sites and research setting

Fieldwork was conducted under formal authorization from Cameroon’s Ministry of Scientific Research and Innovation (MINRESI; see the Ethical Considerations section). The fieldwork covered the five administrative divisions of Adamaoua: Vina, Mbéré, Faro-et-Déo, Mayo-Banyo, and Djérem. Research sites included Ngaoundéré and its surrounding dairy-producing localities, as well as Meiganga, Tignère, Banyo, Mayo-Djinga, Mayo-Darlé, Ngaoundal, Idool, and other sites associated with milk production, collection, processing, marketing, veterinary services, and dairy development initiatives (see Fig. 1).

Access, research relations, and fieldwork assistance

At the outset of fieldwork, meetings with regional and local authorities, veterinary personnel, cooperative representatives, dairy-sector officials, and other institutional actors were undertaken to introduce the research, explain its objectives, and clarify its anticipated outputs. These initial encounters were important both ethically and practically, as they facilitated access to pastoral and dairy networks and clarified the researcher’s role.

Bia Mamoudou, a Fulbe milk collector and a key actor in Idool's dairy economy, contributed to this research as both an interlocutor and a fieldwork assistant. His knowledge of local producers, milk-collection practices, and marketing networks helped us access relevant dairy sites and participants and deepened my understanding of the local milk economy. During the research, his role as president of the Cameroon milk collectors' value chain, along with his longstanding involvement in the sector and recognition among public and private stakeholders, enabled us to obtain updated lists of cattle owners, milk producers, collectors, and other dairy actors. Repeated interviews and participant observation with Bia Mamoudou provided an important perspective on changing dairy practices in Adamaoua, particularly regarding milk collection, producer–collector relations, and the organization of local marketing networks. He was compensated for his time and practical fieldwork assistance, not for interview responses or for specific information. With his informed consent, the study identifies him by name and acknowledges his contribution to the research.

Sampling, participants and study limitations

Participants were selected through purposive sampling, a qualitative strategy in which individuals are deliberately identified for their experiences, roles, or knowledge particularly relevant to the research questions (H. Russell Bernard, 2017; Palinkas et al., 2015; Patton, 2014, pp. 402–403). Initial contacts were identified through institutional meetings, dairy-sector lists, cooperatives, collection centers, veterinary services, local associations, and assistance from Bia Mamoudou. Additional participants were identified through referrals and by targeting individuals in relevant positions within the regional dairy economy.

The sample was designed to capture variation across social positions, occupational roles, gender, mobility, settlement history, herd composition, market participation, and access to dairy infrastructure. It included Fulbe and Mbororo milk producers; women engaged in milking, processing, and sales; milk collectors; processors and resellers; cooperative leaders; veterinary and animal health personnel; and institutional and development actors.

A strictly probabilistic sampling strategy was neither feasible nor ethically appropriate across all field sites. Some remote settlements were difficult to access, and insecurity, including recurrent kidnappings and travel risks, constrained mobility. Purposive sampling enabled inclusion of a diverse range of participants and sites while avoiding travel arrangements that could expose participants or research personnel to unnecessary risk. The sample is therefore not statistically representative of all dairy actors in Adamaoua; rather, it was designed to generate analytically diverse, information-rich accounts of dairy production, quality, market access, and pastoral transformation.

In total, 134 participants took part in semi-structured, in-depth interviews, with cattle herds ranging from 2 Montbéliard cows to 187 crossbred cattle made up mostly of Gudali, Mbororo, Holstein, Montbéliardes, or Girolando. They held various positions across Adamaoua's dairy economy, as summarized in Table 1. Twenty-three households owned Montbéliardes (two also kept Holsteins), while 11 owned Holsteins

(two also kept Montbéliardes). Most others relied on local cattle, especially Goudali, sometimes with crossbreeds to improve milk yields.

Table 1

Distribution of participants across sector, ethnicity[a], and gender.

Participant category	Total	Women		Men			Age range
		Fulbe	Mbororo	Fulbe	Mbororo	other	
Herders/milk producers	62	02	15	26	19	—	25–55
Cooperative leaders	23	01	—	20	02	—	35–70
Milk collectors	09	—	03	06		—	30–50
Milk processors and resellers	17	03	06	08	—	—	25–55
Veterinarians/animal-health personnel	10	01	—	06	—	03	35–65
Institutional stakeholders and development practitioners	13	02	—	07	—	04	30–65
Total	**134**	**9**	**24**	**73**	**21**	**7**	**25–70**

[a]Ethnic affiliation refers to participants' voluntary self-identification when relevant to the analysis. "Other participants" includes interviewees who did not identify as Fulbe or Mbororo. Dashes indicate no participants in that category.

This study is not intended to provide statistically representative estimates of attitudes or practices among all pastoral and dairy actors in Adamaoua. Few participants openly discussed negative perceptions of milk associated with Mbororo producers, and vendors reported some accounts of consumer preferences rather than collecting them through consumer interviews. Insecurity and limited access to some remote settlements also shaped which field sites and participants we could include. The analysis therefore does not claim that all Fulbe actors, consumers, or dairy institutions share the same views. Instead, it examines how particular evaluations of milk quality and provenance become commercially consequential in specific settings and through market relationships.

Interviews, participant observation, and visual materials

Semi-structured interviews combined common thematic prompts with follow-up questions adapted to participants' roles in the dairy sector. They explored milk production and circulation; local understandings of quality, hygiene, taste, and freshness; consumer trust and market relations; access to veterinary care, cooperatives, refrigeration, and development initiatives; and the intersections of gender, mobility, pricing, and changing pastoral livelihoods. To gather detailed descriptions, we interviewed each household individually.

Questions about Mbororo milk and producer identity were approached with care. Rather than relying solely on direct questions about ethnicity or stigma, interviews also examined how participants assessed milk provenance, handling, taste, supply regularity, hygiene, consumer preferences, and trust. This approach helped identify both explicit statements about milk and indirect factors that shaped quality assessments.

Participant observation was conducted in pastoral households, cattle camps, milk-collection centers, dairy bars, periodic markets, cooperatives, processing units, veterinary settings, and institutional meetings. This made it possible to document everyday practices, including milking, milk handling, storage, collection, transport, processing, sale, consumption, and refusal. With participants' consent, the study used visual documentation to record dairy infrastructure, processing practices, equipment, and market settings.

Analytical approach

We analyzed interview material, fieldnotes, participant observation, and visual documentation to identify recurring themes relevant to the research questions. These included milk handling and quality, hygiene, trust, milk provenance, consumer preferences, mobility, market access, dairy infrastructure, and relations between Fulbe and Mbororo actors.

We compared accounts from producers, collectors, processors, vendors, veterinarians, and institutional actors with observations of milk production, collection, processing, and sale. In analyzing perceptions of milk sourced from Mbororo households, we distinguished among participants' own evaluations, dairy vendors' reports of customer preferences, and practices observed during fieldwork, including avoidance, reliance on intermediaries, and differential treatment of milk. This distinction was necessary because views about Mbororo milk were not expressed consistently or equally openly across settings.

Quotations serve as illustrative examples of broader themes or contrasting positions identified across the material. They are interpreted alongside observations and accounts from differently situated participants, rather than as statistically representative of all interviewees.

Results

The results distinguish between participants' explicit evaluations, consumer preferences reported by vendors and dairy-bar owners, and practices observed in the field. This distinction matters because views of milk associated with Mbororo producers were neither universal nor uniformly positive across settings.

Milk as a social boundary: classification, purity, and difference

This section draws on semi-structured interviews, participant observation, and visual documentation conducted throughout Adamaoua's dairy sector. It focuses on milk resellers and dairy-bar owners because their daily transactions place them at the interface between producers and consumers. Their

accounts offer insight into the questions, refusals, and preferences encountered at the point of sale, though they do not represent the views of all consumers or all Fulbe actors.

A minority of the key milk processors and resellers interviewed explicitly expressed negative evaluations of milk associated with Mbororo producers. These evaluations were especially salient among Fulbe dairy-bar owners and vendors who interacted directly with consumers. Four of the seventeen milk processors and resellers interviewed reported that customers considered milk from Mbororo producers less desirable, particularly regarding perceived hygiene, consistency, and trustworthiness. Some vendors also described reluctance to source such milk. These accounts do not establish that milk from Mbororo producers is inherently unhygienic, diluted, or materially inferior, nor do they demonstrate that all consumers or Fulbe vendors share these views. They nevertheless reveal a commercially consequential discourse in which the presumed origin of milk shapes trust, sourcing decisions, and marketability.

An owner of a well-known dairy bar in Ngaoundéré, the capital of the Adamaoua region, explained:

I never get milk from mobile Mbororo suppliers. At most, I might buy butter from them occasionally, but even that is rare. Every time I have used their milk, customers complain that it tastes different. People here are convinced that some Mbororo dilute their milk with water just to increase the volume. And the worst part, according to them, is that when you confront them, they deny it immediately.

This account combines the vendor's own sourcing decision with allegations he attributed to customers. It does not verify the claim that milk is diluted. However, it shows how such allegations may affect vendors' willingness to buy milk from mobile Mbororo producers.

A milk vendor in Ngaoundal likewise linked consumer reluctance to the perceived source of the milk:

That is precisely why you don't see any dairy bars in this town. Mbororo women dominate the entire collection and sales chain here. Several people have tried to open dairy bars, but they lose money because customers don't return after tasting the milk from Mbororo suppliers. The milk they bring is too thin; people say it's 'like water,' not real milk.

Rather than treating this statement as a verified account of the entire dairy chain in Ngaoundal, it is more useful to read it as the vendor's explanation of local commercial difficulties. The phrase "like water" was especially significant: it questioned not only the milk's density or taste but also the honesty and competence of those involved in its production and sale.

A processor in Meiganga emphasized the regularity and reliability he associated with his organized Fulbe suppliers:

I *don't source milk from Mbororo suppliers at all. I process about 110 liters per day, all from two organized Fulbe suppliers: 40 liters from the Idool milk collection center and 70 liters from the Hosseré Tchedé cooperative here in Meiganga. With them, at least, I know what I'm getting: the milk is consistent, and I don't have to worry about hygiene.*

Here, “hygiene” and “consistency” were associated not only with producers’ social identity but also with the organizational arrangements governing milk circulation: collection centers, cooperatives, regular suppliers, and predictable volumes. The contrast was therefore not solely ethnic. It was also mediated by differential access to infrastructure, a regular supply, storage facilities, and organized marketing arrangements. Yet these practical differences could become entangled with broader assumptions about mobility and Mbororo identity.

Participant observation also showed that distrust was not always expressed publicly. During a visit to a Mbororo cattle camp, a Fulbe herder declined fresh milk offered by a Mbororo herder, publicly explaining that he was fasting. In a later private conversation, he said he did not trust milk sourced from Mbororo households. This episode suggests that negative judgments could be socially sensitive and situational: they were sometimes muted in the presence of others but expressed more directly in private. Such evaluations extended beyond commercial transactions to practices of hospitality, commensality, and social proximity.

Stigma, intermediation, and unequal market positions

The preceding accounts indicate that milk was rarely anonymous in local dairy markets. At the point of sale, vendors, intermediaries, and consumers evaluated milk based on its presumed source, the producer or supplier's reputation, the mode of transport, and the conditions of storage and sale. These assessments occurred even when no laboratory testing, grading, or formal certification was available.

Across the field sites, some dairy-bar owners, resellers, and processors described milk from settled Fulbe producers, cooperatives, or recognized collection centers as more “reliable,” “clean,” or commercially secure. Milk from mobile Mbororo producers was more likely to be treated as requiring rapid sale, additional processing, or circulation through a better-known intermediary. This did not mean that Mbororo producers were absent from dairy markets. On the contrary, their milk often remained essential to local supply. However, their ability to sell directly to urban consumers and to retain value added through refrigeration, processing, packaging, branding, and distribution was more limited.

A recurring pattern in the Faro-et-Déo division illustrates this dynamic. Harissou Adamou, a Mbororo producer, explained that he rarely goes directly to market. Instead, he sells his milk to Mohamadou, a Fulbe processor in Tignère. As he put it:

Mohamadou enjoys people’s trust across different markets. I prefer to sell to him. If I went myself, I would struggle to sell anything. He has set up several selling points at periodic markets, each equipped with a refrigerator, so he can keep his products at the right temperature and sell them over several days. We, on the other hand, must sell everything the same day. The system he has built allows him to secure a steady milk supply. We practice seasonal transhumance, so it is very difficult for us to develop the value chain or bring in animals from other regions.

Harissou's account highlights several practical constraints on direct marketing: seasonal mobility, limited cooling and storage facilities, the need to sell perishable milk quickly, and restricted access to stable outlets. By contrast, Mohamadou's enterprise integrated refrigeration, storage, processing, packaging, transport, and multiple selling points. These arrangements enabled him to preserve dairy products longer, maintain a more regular supply, and sell products under a recognizable brand.

Mohamadou did not reject milk from Mbororo producers. He explained that his own production was insufficient to meet demand for milk and dairy products, so he purchased milk from Mbororo households. He described this dependence with the Fulfulde proverb *soyinde daada on mussini maama*: "It is because the mother is absent that the child suckles its grandmother." The proverb casts milk sourced from Mbororo households as essential to the continuity of his business while positioning it as a secondary or substitute source relative to an idealized primary one.

This relationship combined dependence with unequal control over marketing. Once milk entered Mohamadou's commercial network, it could be cooled, stored, fermented, processed into yogurt or cheese, packaged, and sold through more stable outlets. Its Mbororo origin could consequently become less visible to consumers, while the processor's name, equipment, and distribution network became the visible basis for consumer trust.

The difference in market value, therefore, cannot be explained by material transformation alone. Mohamadou's access to refrigeration, transport, labor, multiple selling points, and an established consumer base enables him to produce milk that is consistently commercial, identifiable, and trustworthy. At the same time, his reputation as a settled processor gives him the authority to present and sell the product under his own name. Mbororo producers, whose mobility and limited infrastructure constrain their ability to store, process, label, and distribute milk, remain dependent on such actors to reach consumers.

Hygiene, modernity, and technical legitimacy

Dairy development initiatives and private processing enterprises (SDDP, PAPA/ADFL, PRODEL, OIP-LAIT-CAM, among others) introduced additional criteria for evaluating milk. Across Adamaoua, projects and dairy operators promoted stainless-steel containers, cold-chain infrastructure, hygienic handling, and veterinary supervision as hallmarks of good dairy production (H. Edima et al., 2014). These interventions do not merely introduce new techniques; they reconfigure how milk is evaluated and how producers are recognized as legitimate or illegitimate economic actors.

The Wely Dairy Plant in Ngaoundéré illustrates this process. Aminou, a Fulbe food engineer responsible for quality control, described the company's efforts to align its procedures with national standards set by the Cameroon Agency for Standards and Quality (ANOR) and its aspiration to meet ISO 9000 requirements. He linked these technical procedures to his pastoral upbringing:

I am the child of a Fulbe herder. I grew up with cattle and milk. What I do here in the factory is another way of caring for milk, but now with standards and machines instead of calabashes. For us, milk was always a serious family business. We had our own rules about purity and what we could do with milk. Today I apply other rules – ANOR, ISO – but in my mind it is still the same responsibility: making sure the milk is good and safe. In Cameroon, we talk about import substitution and modernizing the dairy sector, but the local offer is still tiny. Two regions produce milk, and eight just consume it. If we don't invest in local chains like Wely, we will always depend on imported milk powder.

Aminou's account suggests that technical quality control was not necessarily seen as a complete break from pastoral concerns about milk. He framed it as another mode of care, grounded in machines, standards, and laboratory procedures rather than in calabashes and household rules. At the same time, meeting these technical expectations required resources that were unevenly available: equipment, cooling facilities, veterinary support, stable supplies, documentation, and specialized expertise. Producers whose livelihoods depended on seasonal mobility struggled to access or maintain these resources.

Selective adaptation and the negotiation of value

Mbororo producers were not simply excluded from the changing dairy markets. Interviews and observations documented a range of strategies they used to maintain or expand their participation: selling through trusted intermediaries, maintaining sales to regular customers, participating in cooperatives where possible, investing in selected equipment, and experimenting with more intensive production. These strategies varied by household resources, mobility patterns, access to land and capital, and connections to market and institutional actors.

The trajectory of Alaji Hamadou, based in Mayo-Djinga in the Mayo-Darlé subdivision, illustrates a relatively well-resourced path. Born into a Mbororo family historically engaged in mobile pastoralism, he developed a more intensive, market-oriented dairy enterprise. During the fieldwork, his farm included about ten Holstein dairy cows, and he sold fresh milk and yogurt. He was also building a dairy-processing facility intended to become a larger production and collection center. He explained:

When my herd is large enough, I will move some dairy cows to the outskirts of Yaoundé or Douala and establish a second production and marketing base. Mayo-Djinga will remain our primary source for dairy cows.

Alaji Hamadou's project demonstrates that Mbororo actors can actively mobilize the language and infrastructure of dairy modernization. He sought to convert pastoral assets—cattle, practical knowledge, and social networks—into an enterprise connected to urban markets and broader ambitions for dairy self-sufficiency. However, his trajectory should not be treated as representative of Mbororo pastoralists. It relied on relatively exceptional resources, including capital, education, access to improved breeds, fixed infrastructure, and relationships with institutional actors.

Mbororo associations, including MBOSCUDA, and dairy development projects have also promoted cooperative organization, processing, packaging, and sanitary improvements as pathways to stronger market participation (Tellen et al., 2016, p. 19). Such initiatives may create opportunities, but their benefits are not equally accessible. They tend to favor production systems that can support fixed equipment, administrative participation, and a regularized supply.

Discussion

The results show neither a simple exclusion of milk sourced from Mbororo households nor a linear shift from mobile pastoralism to standardized dairying. Mbororo producers remained active and, in some cases, indispensable to the local milk supply. Yet the terms used to recognize, value, process, and market milk were applied unevenly. The following discussion examines how these unequal arrangements intersect with broader moral languages of purity, stigma, distinction, and technical quality.

Hygiene, purity, and the ethnicization of quality

The findings do not suggest that hygiene concerns are merely imagined or that milk quality is purely symbolic. As Edima, Awono, and Ndjouenkeu's (2013) microbiological study shows, the dairy chain around Ngaoundéré faces significant material constraints, including rudimentary milking practices, inadequately cleaned containers, prolonged transport at ambient temperatures, and limited cold-chain infrastructure. These conditions pose real contamination risks. However, Edima, Awono, and Ndjouenkeu (2013) do not compare milk quality by producers' ethnic affiliation; instead, they identify critical vulnerabilities across the dairy chain, from the udder and producer containers to transport and processing.

Findings indicate that these broader concerns may nonetheless be selectively attributed to milk from mobile Mbororo producers. Some Fulbe dairy-bar owners and processors described milk from Mbororo households as "water-like," unreliable, or unhygienic, whereas milk from recognized collection centers, cooperatives, or settled suppliers was more readily associated with consistency, cleanliness, and trust. These assessments reflected more than measurable differences in milk composition. They linked milk's presumed source to broader assumptions about mobility, handling practices, producer credibility, and commercial respectability.

Douglas's (2003) account of purity and pollution helps clarify this process. Her argument is not that dirt lacks material existence, but that substances become morally problematic when understood as "matter out of place" within a given classificatory order (Douglas, 2003, p. 41). In Adamaoua, accusations of dilution, dirt, or "water-like" milk can be understood as more than technical claims. They identify specific milk and, by extension, specific producers as suspect. Milk associated with mobile pastoralism may thereby come to signify not only a possible sanitary risk but also an inappropriate, unreliable, or socially inferior mode of production.

This interpretation aligns with ethnographic work showing that moral and relational norms have long governed the use of milk in Fulbe societies. Kuhn (1997) shows that the production, circulation, and transformation of milk are embedded in rules governing entitlement, proper handling, social relations, and the reproduction of pastoral life. In this sense, contemporary judgments about milk quality do not necessarily mark a complete break with earlier moral orders. Rather, they may rework established distinctions using new languages of hygiene, technical competence, and commercial reliability.

Infrastructure, intermediation, and commercial legitimacy

The results further demonstrate that market inequality does not stem from ethnic stereotypes alone. It is also shaped by unequal access to the infrastructure needed to cool, store, process, transport, package, and sell milk. The case of Mohamadou and Harissou illustrates this point. Harissou's milk was not excluded from the dairy economy; it was necessary to Mohamadou's supply. Yet Mohamadou controlled key stages through which raw milk became recognizable and marketable dairy products: refrigeration, storage, processing, packaging, transport, and sale through multiple outlets.

This relationship reveals interdependence, not equality. Mbororo producers may supply milk, while processors and intermediaries with greater infrastructure and reputational capital are better positioned to define its quality, stabilize its value, and present it to consumers under a trusted name. Once milk enters a processor's network, its origin may become less visible, and the processor's equipment, label, and commercial reputation become the primary basis for consumer confidence.

Bourdieu's (1984) theory of distinction is useful here because it highlights the unequal power to define what counts as legitimate practice. Judgments about "clean," "reliable," or "modern" milk do not merely classify products; they also classify producers and production systems. As Bourdieu writes, "taste classifies, and it classifies the classifier" (Bourdieu, 1984, p. 6). In the dairy sector, preferences for standardized containers, regular supply, cooling facilities, packaging, and veterinary supervision can signal technical competence. Yet since access to these resources is uneven, the capacity to perform technically recognized forms of dairy production can become a source of symbolic and commercial legitimacy.

This does not mean that all Fulbe producers are equally advantaged, nor that all Mbororo producers are excluded from modernization. Rather, it indicates that actors with capital, fixed infrastructure, reliable market connections, and institutional support are generally better positioned to meet emerging quality expectations. Mobility may exacerbate these challenges, particularly when participation in formalized value chains depends on continuous supply, traceability, refrigeration, administrative procedures, and proximity to processing facilities.

Modernization, selective adaptation, and pastoral futures

The findings also challenge the simple opposition between pastoral "tradition" and dairy "modernity." Mbororo producers were not passive recipients of stigma or development interventions. They

maintained sales through trusted networks, strategically used intermediaries, joined cooperatives where possible, adopted selected technologies, and, in some cases, invested in more intensive production. Alaji Hamadou's enterprise exemplifies one such pathway: he mobilized pastoral assets, dairy knowledge, improved breeds, and institutional connections to develop a more market-oriented dairy project.

However, such examples should not be taken as representative of all Mbororo producers. More intensive dairy production requires access to land, capital, improved animals, feed, water, buildings, equipment, veterinary support, and market outlets. The question is therefore not whether Mbororo pastoralists can become "modern" dairy producers, but under what material, social, and institutional conditions particular forms of modernization are possible—and for whom. This argument parallels research on pastoral adaptation elsewhere in Cameroon. Moritz (2008) shows that peri-urban Fulbe pastoralists in the Far North did not choose between mobility and intensification. Instead, they combined purchased dry-season feed, village-based production, transhumance, and entrusting animals to mobile herders. These findings caution against treating mobility as the opposite of innovation. Pastoralists may combine extensive and intensive strategies to respond to ecological uncertainty, household needs, and shifting market conditions.

Similarly, research on nomadic Fulani milk processors in northern Nigeria shows that knowledge of hygienic practices does not necessarily translate into action. Inadequate water, limited equipment, and infrastructure constraints can prevent producers from implementing practices they recognize as desirable (Ghali-Mohammed et al., 2025). This comparison underscores the importance of distinguishing among knowledge, intention, and the material capacity to comply with quality requirements. It also suggests that interventions focused solely on training or behavioral change may overlook the infrastructural conditions that shape dairy hygiene in practice.

Contributions to debates on pastoral inequality and quality governance

The analysis contributes to three related bodies of scholarship. First, it extends research on pastoral marginalization, which has often focused on citizenship, land, political incorporation, and legal exclusion (Azarya, 1996; Pelican & Mimche, 2012). These issues remain central, but the findings show that inequality is also enacted through the mundane material life of milk: containers, collection routes, cooling facilities, taste judgments, vendor preferences, and practices of refusal or intermediation. Ethnic hierarchy is reproduced not only through state institutions or land conflicts but also through market conventions that distinguish credible from suspect milk and legitimate from less legitimate producers.

Second, the article develops anthropological approaches to purity and distinction by showing how moral classifications can be articulated through technical quality regimes. The movement toward hygiene protocols, refrigeration, veterinary monitoring, packaging, and certification does not abolish moral economies. Instead, it creates new sites where older judgments about trust, respectability, and belonging may be reformulated. Technical standards can become forms of symbolic power when the capacity to meet them is unequally distributed and when compliance is tied to broader claims of social legitimacy.

Third, the case contributes to scholarship on the social construction of quality and agro-food governance (Busch, 2000; Muniesa et al., 2007; Ponte & Gibbon, 2005). Quality is neither merely an intrinsic property of milk nor a neutral mechanism for reducing uncertainty. Rather, it is produced through material infrastructures, expert knowledge, institutional procedures, and market relations. In Adamaoua, the capacity to demonstrate quality depends on access to unevenly distributed resources, including refrigeration, transport, containers, processing equipment, veterinary expertise, traceability, and reliable market outlets.

Milk commercialization in Adamaoua therefore does not entail a straightforward transition from relational pastoral economies to impersonal markets. Trust, reputation, producer identity, social proximity, and moral evaluations continue to shape how milk is valued, even as standardized quality governance expands. The dairy economy is best understood as a layered field where material risks, moral judgments, market infrastructures, and historically unequal relations of belonging intersect. Milk is a particularly revealing substance through which the material politics of hierarchy, modernization, and pastoral futures are negotiated.

Conclusion

This article shows that transformations in the dairy sector of Cameroon's Adamaoua region cannot be understood solely as processes of technical modernization or market expansion. They are also reconfigurations of historically situated regimes of value, in which milk circulates as nourishment, a source of household reproduction, a marketable product, and a morally charged substance. The analysis demonstrates that contemporary languages of "quality," "hygiene," and "modern" production do not simply replace earlier pastoral classifications. Instead, they can rework existing distinctions concerning mobility, respectability, trust, and belonging within new institutional, commercial, and technical frameworks. The findings do not suggest that concerns about milk hygiene are merely symbolic. Problems with handling, transport, storage, contamination, and inadequate cold-chain infrastructure are material issues in Adamaoua's dairy chain. The article shows that broader concerns about hygiene and reliability may be selectively associated with milk from mobile Mbororo producers, whereas milk marketed through recognized collection centers, processors, cooperatives, or established commercial networks is more readily treated as trustworthy. In this way, milk-quality assessments may link technical concerns to moral judgments about producers, mobility, and social position. These processes have concrete economic consequences. Access to refrigeration, transport, processing equipment, veterinary services, regular outlets, packaging, and institutional networks enables some actors to stabilize milk quality, build consumer trust, and capture greater value across the dairy chain. Other producers may remain dependent on intermediaries, rapid informal sales, and personal networks, even when their milk is essential to the local supply. The resulting dairy economy is therefore marked by both interdependence and inequality: Mbororo producers are not simply excluded from the market, but their capacity to define, demonstrate, and benefit from recognized quality is often more constrained. The article contributes to scholarship on pastoral marginalization by showing that inequality is enacted not only through land access, citizenship, state policy, and formal political representation, but also through the ordinary

material life of milk. Practices of milking, handling, collecting, cooling, processing, selling, and refusing milk reproduce, negotiate, and sometimes challenge broader distinctions between Fulbe and Mbororo. It also contributes to anthropological debates on purity, distinction, and quality governance by showing that technical standards are not external to moral economies. Rather, technical expertise, infrastructures, and quality procedures become entangled with historically grounded relations of status, trust, and symbolic legitimacy. For dairy development policy, the findings suggest that interventions focused solely on training, standardization, or individual compliance are insufficient. Improving milk safety requires investment in the material conditions of production and circulation: clean equipment, clean water, cooling facilities, transport, veterinary support, processing capacity, and market access. These interventions should also recognize that standardized models may be difficult to implement in mobile pastoral systems unless adapted to pastoralists' ecological conditions, seasonal movements, and existing social networks. Treating mobility as a sign of backwardness risks reproducing the very inequalities that dairy modernization claims to address. Milk in Adamaoua is therefore not merely a commodity entering a more formal market. It is a medium through which technical standards, moral evaluations, infrastructure, and ethnic relations interact. Tracing milk through pastoral households, collection networks, processing facilities, and markets shows that producing dairy value is also a process of producing social difference.

Declarations

Author Contribution

H.H. collected the data, conceptualized the study, wrote the first draft of the manuscript, and conducted all analyses. M.W.N. contributed to the analyses and interpretation of the data, edited and revised the manuscript. Both authors approved the final version and agreed to be accountable for all aspects of the work.

Acknowledgement

This work is part of the ERC Consolidator Grant COMPLEXITY (No. 101043382; DOI: https://doi.org/10.3030/101043382). For the purpose of open access, the authors have applied a Creative Commons Attribution (CC BY) public copyright license to any Author Accepted Manuscript (AAM) version arising from this submission, in accordance with the ERC and European Commission open access requirements.We are deeply grateful to the Fulbe pastoralists, milk producers, collectors, processors, cooperative members, and other dairy-sector actors in Adamaoua who shared their time, experiences, and knowledge with us. We are especially indebted to Bia Mamoudou, a Fulbe milk collector and a key actor in Idool's dairy economy, for his invaluable contribution to the fieldwork. His extensive knowledge of local producers, milk-collection practices, and marketing networks, along with his assistance in gaining access to dairy sites and participants, greatly enriched this research. We thank him for his generosity, practical support, and sustained engagement with the project. We are also grateful to

CNEBCAM, ACEFA, CAMVET, CCIMA, CDEN, MINEPIA, PD-CVEP, MSEG, UDEVI, PNDP, and all other institutions that contributed to this study, as well as to research collaborators, local authorities, and supervisors for their support throughout the research. Any remaining errors in interpretation or representation are our own.

Generative AI Disclosure

Proofreading and editing (grammar checking, syntax correction, and readability enhancements) were undertaken with the help of Grammarly. The authors maintained full supervision over all AI-generated suggestions, manually reviewing and validating all edits to preserve original scientific meaning.

Clinical trial number:

not applicable.

References

1. Appadurai, A. (1986). Introduction: Commodities and the politics of value. *The Social Life of Things: Commodities in Cultural Perspective*.
2. Azarya, V. (1978). *Aristocrats facing change: The Fulbe in Guinea, Nigeria, and Cameroon*. University of Chicago Press Chicago.
3. Azarya, V. (1993). Sedentarization and ethnic identity among the Fulbe: A comparative view. *Senri Ethnological Studies*, *35*, 35–60.
4. Azarya, V. (1996). Pastoralism and the state in Africa: Marginality or incorporation? *Nomadic Peoples*, 11–36.
5. Bayemi, P., Bryant, M., Perera, B., Mbanya, J., Cavestany, D., & Webb, E. (2005). Milk production in Cameroon: A review. *Livestock Research for Rural Development*, *17*(6), 1.
6. Bierschenk, T., & Le Meur, P. Y. (1997). *Trajectoires Peules au Bénin: Six études anthropologiques*. KARTHALA Editions.
7. Bocquené, H., & Ndoudi, O. (1986). *Moi, Un Mbororo: Autobiographie de Oumarou Ndoudi, Peul Nomade du Cameroun*.
8. Bourdieu, P. (1984). A social critique of the judgement of taste. *Cambridge, MA*.
9. Boutrais, J. (2005). Lait et produits laitiers en Adamaoua: Peuls buveurs de lait, Peules vendeuses de lait. *Ressources Vivrières et Choix Alimentaires Dans Le Bassin Du Lac Tchad*, 413–434.
10. Burnham, P. (1996). *The politics of cultural difference in northern Cameroon*. Edinburgh University.
11. Busch, L. (2000). The moral economy of grades and standards. *Journal of Rural Studies*, *16*(3), 273–283.

12. Catley, A., Lind, J., & Scoones, I. (2013). *Pastoralism and development in Africa: Dynamic change at the margins*. Taylor & Francis.
13. Corniaux, C., Duteurtre, G., & Broutin, C. (2014). *Filières laitières et développement de l'élevage en Afrique de l'Ouest. L'essor des minilaiteries*. Karthala.
14. De Bruijn, M. (1997). The hearthhold in pastoral Fulbe society, central Mali: Social relations, milk and drought. *Africa*, *67*(4), 625–651.
15. De Vries, L. (2020). Navigating violence and exclusion: The Mbororo's claim to the Central African Republic's margins. *Geoforum*, *109*, 162–170.
16. Douglas, M. (2003). *Purity and danger: An analysis of concepts of pollution and taboo*. Routledge.
17. Edima, H., Awono, E., Biloa, D., Tchoumkeu, H., & Etoa, F. (2014). *Evaluation of the good hygienic practices on the production of kindirmou and lebol*.
18. Edima, H., Awono, E., & Ndjouenkeu, R. (2013). An analysis of the milk quality in Cameroon. A study in Adamawa region. *Journal of Scientific Research & Reports*, *2*(1), 337–346.
19. Edima, H. C., Dazeck, D. F., & Amadou, A. (2021). *Characterization of the dairy production system in the Vina division, Adamawa region, Cameroon*.
20. Ghali-Mohammed, I., Azeez, A. A., Adetona, M. A., Bakare, A. A., Isola, T. O., Olawoye, D. C., Alhaji, N. B., & Odetokun, I. A. (2025). Knowledge, attitude, and practice levels of Fulani milk processors toward milk contamination and hygiene in Northern Oyo State, Nigeria. *Discover Food*, *5*(1), 205. https://doi.org/10.1007/s44187-025-00506-3
21. Goody, J. (1982). Cooking, cuisine and class. *Cambridge: Cambridge Univer*.
22. H. Russell Bernard (2017). *Research Methods in Anthropology: Qualitative and Quantitative Approaches: 732 pages* (6e édition). Bloomsbury Publishing PLC.
23. Hickey, S. (2007). Caught at the crossroads: Citizenship, marginality and the Mbororo Fulani in Northwest Cameroon. *Making Nations Creating Strangers: States and Citizenship in Africa*, *16*, 83.
24. Johnston, J., & Baumann, S. (2014). *Foodies: Democracy and distinction in the gourmet foodscape*. Routledge.
25. Kouamo, J., & Oumarou, S. (2026). Evaluation of breeding conditions for Montbeliarde cows in northern Cameroon. *Revue d'élevage et de Médecine Vétérinaire Des Pays Tropicaux*, *79*, 37650.
26. Kouamo, J., & Pa-ana, P. (2017). Typology of cattle farms in the northern regions of Cameroon. *Revue d'élevage et de Médecine Vétérinaire Des Pays Tropicaux*, *70*(3), 73–80.
27. MINEPIA (2023). *Production and imports in the livestock, fisheries, and animal industries sub-sector*. MINEPIA. https://minepia.cm/site/wp-content/uploads/2024/11/ PRODUCTION-AND-IMPORTS-IN-THE-LIVESTOCK-FISHERY-ANDANIMAL- INDUSTRY-SUB-SECTOR_2023.pdf (accessed on 10/11/24).
28. MINEPIA. (2025). *Filière lait et produits laitiers. [Rapport Gouvernemental]*. MINEPIA.
29. Mintz, S. W. (1985). *Sweetness and power*. Viking New York.

30. Moritz, M. (2008). Competing paradigms in pastoral development? A perspective from the Far North of Cameroon. *World Development*, *36*(11), 2243–2254.
31. Moritz, M., Bruno, J. E., Murphy, D. J., Fernández-Giménez, M. E., & Schareika, N. (2025). Transformations in livestock systems: Beyond ranching and pastoralism. *Agriculture and Human Values*, 1–17.
32. Muniesa, F., Millo, Y., & Callon, M. (2007). An introduction to market devices. *The Sociological Review*, *55*(2_suppl), 1–12.
33. Nchinda, V. P., Shidiki, A. A., Umoren, E. P., Ijang, T. P., Temoso, O., Che, M. A., Chi, N. F., & Ndambi, O. A. (2025). Empirical evidence of the impact of farmer-grazer conflicts on milk yield in Cameroon. *NJAS: Impact in Agricultural and Life Sciences*, *97*(1), 2447230.
34. Njeufa, E. B., Edima, H. C., & Ndjouenkeu, R. (2021). Characterization of Technical Production System of Kindirmou, a Fermented Local Milk Product from Cameroon. *Int J Curr Microbiol App Sci*, *10*(06), 10–28.
35. Oussoumanou, Y., Victor, T., & Ingrid, G. K. N. (2025). La chaine de valeur viande bovine dans la région de l'Adamaoua au Cameroun: Acteurs et apports. *Revue Internationale de La Recherche Scientifique (Revue-IRS)*, *3*(1), 726–737.
36. Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research*, *42*(5), 533–544.
37. Patton, M. Q. (2014). *Qualitative research & evaluation methods: Integrating theory and practice*. Sage.
38. Pelican, M. (2008). Mbororo claims to regional citizenship and minority status in North-West Cameroon. *Africa*, *78*(4), 540–560.
39. Pelican, M. (2012). Mbororo pastoralists in Cameroon: Transformations in identity and political representation. *A Afro-Eurasian Inner Dry Land Civilizations*, *1*, 113–126.
40. Pelican, M. (2015). *Masks and staffs: Identity politics in the Cameroon Grassfields* (Vol. 11). Berghahn Books.
41. Pelican, M., & Mimche, H. (2012). *Quand les immigrants se font autochtones: Dynamiques d'insertion des Mbororo et insécurité foncière à l'ouest-Cameroun*.
42. Ponte, S., & Gibbon, P. (2005). Quality standards, conventions and the governance of global value chains. *Economy and Society*, *34*(1), 1–31.
43. Provost, J., Rosero, G., Brümmer, B., & Schlecht, E. (2022). To sell, not to sell, or to quit: Exploring milk producers' approaches after a supply chain disruption in Northwest Cameroon. *World Development*, *150*, 105709.
44. Sadler, K., Kerven, C., Calo, M., Manske, M., & Catley, A. (2010). The fat and the lean: Review of production and use of milk by pastoralists. *Pastoralism*, *1*(2), 291–324.

45. Schareika, N., Brown, C., & Moritz, M. (2021). Critical transitions from pastoralism to ranching in Central Africa. *Current Anthropology*, *62*(1), 53–76.
46. Tellen, V. A., Anchang, J. A., & Shu, M. (2016). Conflicts Over Land and Pasture in North West Cameroon: Listening to the Voices of Farmers and Grazers. *Working Report, Pan African Institute for Development–West Africa (PAID-WA), Buea, Cameroon*, *61*, 13.

Figures

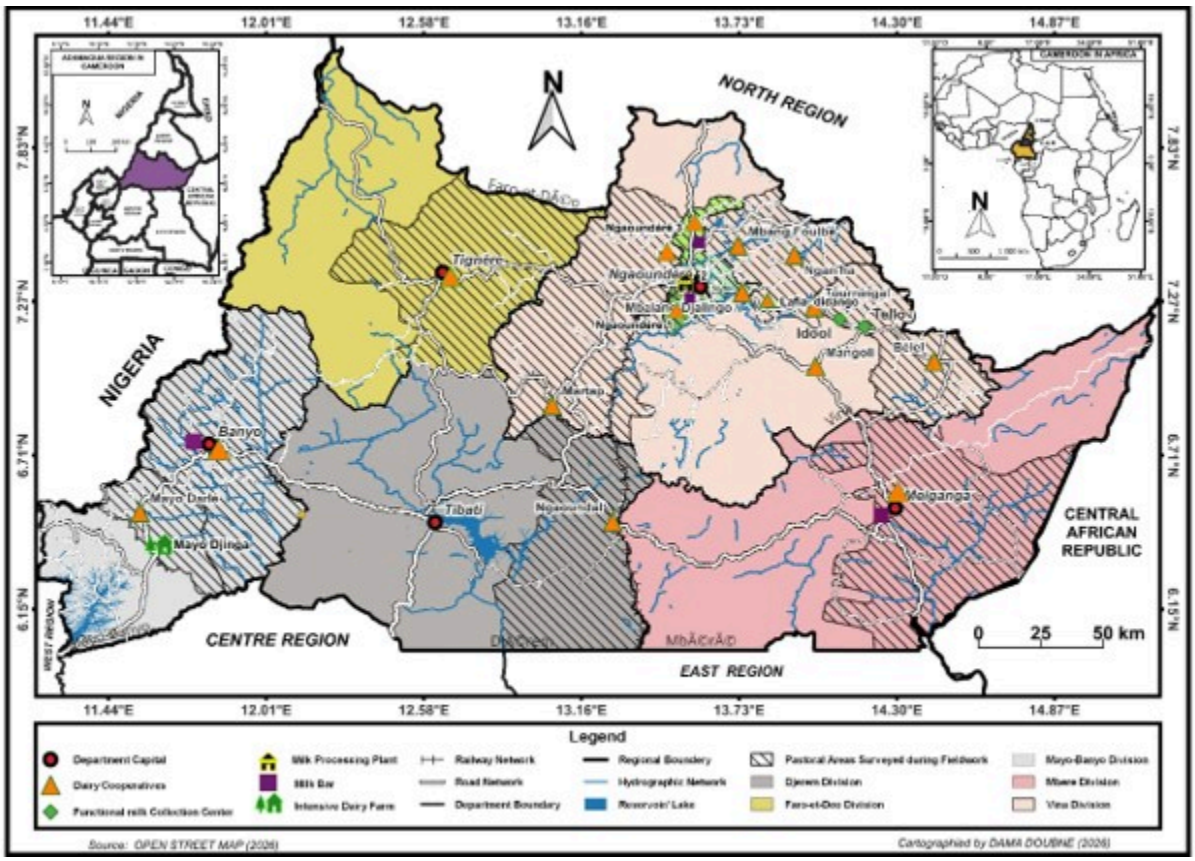


Figure 1

Study area and main dairy field research sites in the Adamaoua Region, Cameroon. Sources: base map data © OpenStreetMap contributors (accessed 2026). Cartography by Dama Doubne.