



Socio-Economic Profile of Fresh Milk Marketers, Product Types, and Marketing Constraints in Borno State, Nigeria

By

Shuaib Jibrin^{1*}, Ibrahim Mustapha Sulumbe², and Mohammed Abba³

¹Department of Agricultural Economics and Extension, Kashim Ibrahim University, Maiduguri, Borno State, Nigeria

²Department of Agricultural Economics, University of Maiduguri, Borno State, Nigeria

³Department of Animal Science, Kashim Ibrahim University, Maiduguri, Borno State, Nigeria



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Abstract

Fresh milk marketing in Borno State, Nigeria, constitutes an important livelihood activity dominated by pastoral households, particularly women. This study examined the socio-economic characteristics of fresh milk marketers, identified the types of milk products marketed, and analyzed the constraints affecting marketing efficiency. Primary data were collected from 302 purposively selected marketers across Biu, Maiduguri Metropolitan Council (MMC), and Monguno Local Government Areas using structured questionnaires. Data were analyzed using descriptive statistics (frequencies, percentages, means, and ranking). Results showed that 89.07% of marketers were female, 71.83% were married, and 66.23% had no formal education. Yoghurt (Kindirmo) was the most marketed product (44.70%), followed by skimmed milk (Nono) (32.12%) and fresh milk (Madara) (23.18%). Major constraints included lack of storage facilities (17.95%), milk spoilage (17.37%), poor road infrastructure (10.93%), lack of credit (9.56%), and insecurity (9.23%). The study concludes that infrastructural deficits and limited access to finance significantly constrain milk marketing efficiency. Investments in cold chain systems, rural infrastructure, and credit access are recommended.

Keywords: Fresh milk marketing, Socio-economic characteristics, Milk product types, Marketing constraints, Borno State

INTRODUCTION

Milk production and marketing constitute a critical component of the livestock sub-sector in Nigeria, contributing to food security, nutrition, and rural livelihoods. Indigenous cattle, particularly the White Fulani breed, account for the bulk of domestic milk production, supplying raw and processed dairy products to rural and peri-urban populations.

In northern Nigeria, traditional dairy products such as Madara (fresh milk), Nono (skimmed milk), and Kindirmo (fermented yoghurt) dominate local markets. These products are largely processed and marketed through informal value chains characterized by limited infrastructure, low capital investment, and minimal institutional support.

Despite Borno State's significant livestock population, fresh milk marketing remains underdeveloped due to infrastructural deficiencies, insecurity, and weak market integration. The absence of structured marketing systems and empirical data

on actors within the value chain limits effective policy intervention.

This study addresses this gap by examining:

1. The socio-economic characteristics of fresh milk marketers;
2. The types of milk products marketed; and
3. The constraints affecting fresh milk marketing in Borno State.

2. MATERIALS AND METHODS

2.1 Study Area

The study was conducted in Borno State, located in the North-East of Nigeria, between latitudes 10°02'N and 13°04'N and longitudes 11°04'E and 14°04'E (Folorunsho, 2006). The state shares international boundaries with Niger to the north, Chad to the north-east, and Cameroon to the east. It covers an area of 69,435 km², constituting 7.69% of Nigeria's total land area, with a population of 4,151,193 (NPC, 2006). Agriculture is the mainstay of the economy; major crops include pearl



millet, sorghum, cowpea, maize, groundnut, rice, and soybean, while livestock and fisheries are also important (Amaza et al., 2009).

2.2. Sampling Procedure

Cluster sampling was used. The study population of fresh milk marketers was stratified into the three senatorial zones of the state. A subset of clusters was selected based on the preponderance of fresh milk marketing activity, and all marketers within selected clusters were surveyed, yielding a sample of 302 respondents across Biu, Maiduguri Municipal Council (MMC), and Monguno LGAs.

2.3 Data Collection

Primary data were collected using structured questionnaires administered by trained enumerators. Data covered socio-economic characteristics of respondents, milk product types, marketing channels, transportation modes, and constraints. Secondary data were obtained from government publications, journals, and research reports.

2.4 Data Analysis

Descriptive statistics including frequencies, percentages, means, and ranking were used to analyse the socio-economic characteristics of marketers, determine the types of milk products marketed, and identify marketing constraints.

3. RESULTS AND DISCUSSION

3.1 Socio-Economic Characteristics of Fresh Milk Marketers

3.1.1 Age Distribution

Table 1 presents the age distribution of the 302 sampled fresh milk marketers.

Table 1: Distribution of Respondents by Age Group (n=302)

Age Group (years)	Frequency	Percentage (%)
Under 20	38	21.58
21 – 30	88	29.14
31 – 40	65	21.52
41 – 50	65	21.52
Above 50	46	12.25
Total	302	100.00

Source: Market Survey, 2026.

Respondents aged 21–30 years constituted the largest proportion (29.14%), suggesting that young adults dominate fresh milk marketing in the study area. This finding aligns with national demographic patterns reported by the National Bureau of Statistics (2020), which indicate that Nigeria has a predominantly youthful population within the working-age

bracket. The 31–40 and 41–50 years groups each accounted for 21.52%, reflecting a strong presence of middle-aged marketers who are typically in their peak productive and decision-making years. According to Todaro and Smith (2015), individuals within this age range contribute substantially to economic productivity and household welfare in developing economies. Respondents above 50 years constituted the smallest proportion (12.25%), consistent with general patterns of declining labour force participation among older individuals.

3.1.2 Gender Distribution

Table 2: Distribution of Respondents by Gender (n=302)

Gender	Frequency	Percentage (%)
Female	269	89.07
Male	33	10.93
Total	302	100.00

Source: Market Survey, 2026.

Female marketers constituted 89.07% of respondents, reflecting the near-total feminization of fresh milk marketing in Borno State (Table 2). This finding is consistent with the cultural and pastoral traditions of Fulani communities, where milk marketing is exclusively a female domain. FAO (2011) documented that women make up a significant proportion of the agricultural labour force in developing regions and are heavily involved in food production, processing, and marketing. The World Bank (2022) similarly emphasizes that women are increasingly active in informal economic activities and small-scale enterprises, particularly in Sub-Saharan Africa. The low male participation (10.93%) likely reflects gender specialization in economic roles, whereby men are responsible for herd management while women handle dairy product processing and sales (Doss, 2018; Scabn & Kydd, 2016).

3.1.3 Marital Status

Table 3: Distribution of Respondents by Marital Status (n=302)

Marital Status	Frequency	Percentage (%)
Married	217	71.83
Single	63	20.83
Widowed	17	5.63
Divorced/Separated	5	1.66
Total	302	100.00

Source: Market Survey, 2026.

A substantial majority (71.83%) of respondents were married (Table 3). This is consistent with findings by Gazechews (2014), who reported that 70% of camel milk marketers in



Eastern Kenya were married women. Marriage is often associated with increased economic stability and shared decision-making, which can support participation in livelihood activities (Becker, 1981). Single respondents (20.83%) may have greater mobility and fewer family responsibilities. Widowed marketers (5.63%) often face unique socio-economic challenges, including loss of household income and increased vulnerability (Chen, 2000).

3.1.4 Household Size

Table 4: Distribution of Respondents by Household Size (n=302)

Household Size (persons)	Frequency	Percentage (%)
1 – 3	210	69.54
4 – 6	66	21.85
7 – 9	23	7.62
Above 10	3	0.99
Total	302	100.00

Source: Market Survey, 2026.

The majority of respondents (69.54%) had household sizes of 1–3 persons, reflecting a dominance of small nuclear family units. This finding suggests increasing urbanization and a gradual shift from extended family systems in parts of Borno State. Households with 4–6 members (21.85%) represent the traditional average household size in Nigeria (NPC, 2019). Larger households (7–9 persons: 7.62%; above 10: 0.99%) may provide more family labour for milk processing and marketing but also impose higher consumption burdens (IITA, 2018).

3.1.5 Educational Attainment

Table 5: Distribution of Respondents by Educational Level (n=302)

Educational Level	Frequency	Percentage (%)
No Formal Education	200	66.23
Islamic Education	47	15.56
Primary Education	37	12.25
Secondary Education	13	4.30
Tertiary Education	5	1.66
Total	302	100.00

Source: Market Survey, 2026.

A high proportion of respondents (66.23%) had no formal education, with an additional 15.56% having only Islamic education (Table 5). This pattern reflects broader educational deficits in rural and pastoral communities of northern Nigeria. Oladele (2012) observed that limited formal education significantly constrains the ability of rural households to adopt modern agricultural innovations and participate effectively in development programmes. Those with primary education (12.25%) possess basic literacy and numeracy skills useful for market transactions. Secondary (4.30%) and tertiary (1.66%) education were rare, consistent with Adebayo's (2010) observation that Nigeria's human capital challenges in rural communities limit income generation and productivity.

3.2 Types of Fresh Milk Marketed in Borno State

Three main dairy products were found to be actively marketed in Borno State: fresh whole milk (Madara), skimmed milk (Nono), and yoghurt (Kindirmo). Table 6 shows the distribution of marketers by product type.

Table 6: Types of Milk Products Marketed by Fresh Milk Marketers in Borno State (n=302)

Milk Product	Frequency	Percent (%)	Cumulative (%)
Fresh Whole Milk (Madara)	70	23.18	23.18
Skimmed Milk (Nono)	97	32.12	55.30
Yoghurt (Kindirmo)	135	44.70	100.00
Total	302	100.00	

Source: Field Survey, 2025.

Yoghurt (Kindirmo) was the most widely marketed product (44.70%), followed by skimmed milk (Nono) at 32.12%, and fresh whole milk (Madara) at 23.18%. This distribution reflects a notable shift toward processed and semi-processed dairy products. The dominance of Kindirmo is consistent with findings by Kubkomawa and Kenneth (2019), who

documented strong consumer preference for locally fermented milk products in West Africa, driven by flavour preferences, cultural practices, and the perception that fermented products offer superior nutritional value and longer shelf life.

The relatively low share of Madara marketers (23.18%) reflects the significant marketing challenges associated with fresh unprocessed milk: high perishability, the absence of cold

chain infrastructure, and security-related transport disruptions characteristic of Borno State's marketing environment (Sara, 2010; Musenwa, 2016). The intermediate share of Nono (32.12%) reflects its processing simplicity and established consumer base; Nono production simultaneously yields

maishanu (butter fat), enabling marketers to diversify revenue from a single raw milk input (Ali & Uche, 2006).

Table 7 presents product-specific volume and price data.

Table 7: Product-Specific Volume and Average Price for Milk Products in Borno State

Milk Product	Marketers (%)	Total Qty Marketed (Litres)	Average Price/Litre (₦)
Fresh Whole Milk (Madara)	23.18	1,106	1,148
Skimmed Milk (Nono)	32.12	3,477	658
Yoghurt (Kindirmo)	44.70	8,451	1,000
Total/Average	100.00	13,034	—

Source: Field Survey, 2025.

Yoghurt commanded the highest total marketed volume (8,451 litres) at ₦1,000 per litre. Fresh whole milk attracted the highest average unit price (₦1,148/litre), reflecting its perceived superior nutritional density (Thakur et al., 2017), though this premium is offset by substantially lower volumes traded due to spoilage risks. Nono's low price (₦658/litre) reflects its status as a by-product of butter processing, with the butter fat component (maishanu) generating a separate revenue stream (Ali & Uche, 2006). Kindirmo's combination of high volume and moderate price confirms it as the most commercially significant product in the Borno State fresh milk market, consistent with the broader sub-Saharan African trend toward value addition to reduce spoilage losses and extend shelf life (Farah, 2017; Wolday, 2014).

The predominance of Fulani women in Kindirmo and Nono marketing (Table 3 indicates 64.90% of marketers are Fulani) is rooted in pastoral cultural norms that assign dairy product processing and sales to women, while men manage the herd (Jamal, 2017; Scabn & Kydd, 2016). Additionally, the reliance on non-refrigerated public transport (50.99%) and foot travel (20.86%) imposes structural constraints on Madara marketing, further incentivizing the shift to fermented products that are inherently more resilient to temperature fluctuations (Barker & Hofman, 2016).

3.3 Constraints to Fresh Milk Marketing in Borno State

Table 8 presents the constraints identified by fresh milk marketers in the study area, ranked by frequency.

Table 8: Constraints to Fresh Milk Marketing in Borno State (n=302)

Constraint	Frequency	Percent (%)
Lack of storage facilities	54	17.95
Milk spoilage/waste	52	17.37
Poor road conditions	33	10.93

Constraint	Frequency	Percent (%)
Lack of credit	29	9.56
Insecurity issues	28	9.23
High transportation costs	20	6.47
Low selling prices	18	5.96
Lack of packaging materials	18	5.94
Seasonal demand fluctuations	17	5.50
Lack of processing facilities	11	3.51
Competition from other sellers	9	3.11
Lack of market information	6	1.92
High market fees/levies	4	1.48
Government policies/regulations	3	1.08
Total	302	100.00

Source: Market Survey, 2025.

The most frequently cited constraints were lack of storage facilities (17.95%) and milk spoilage/waste (17.37%), which are structurally interrelated. Milk is highly perishable, and without adequate cooling or preservation technologies, deterioration is rapid. Iyiola-Tunji et al. (2019) reported that milk in northern Nigeria is often stored for less than two hours before processing, leading to high spoilage rates. FAO (2016)

identified poor handling practices and lack of storage technologies as major causes of post-harvest losses along milk value chains in sub-Saharan Africa.

Poor road conditions (10.93%) and high transportation costs (6.47%) indicate severe infrastructural deficiencies. In many rural parts of Borno State, milk-producing areas are remote and inaccessible, with milk often transported by foot or donkey, increasing delivery time and spoilage risk. This finding aligns with evidence from Musenwa (2016), who identified poor road networks as a principal constraint to dairy market access in pastoral contexts, and with Sara (2010), who highlighted that remote location of pastoralists, compounded by poor road infrastructure, results in high transaction costs that reduce prices available to producers.

Lack of credit (9.56%) constrains the capacity of marketers to invest in storage, transport, and processing equipment. Most dairy marketing actors operate in the informal sector with limited access to formal financial institutions (Fakayode et al., 2012). Insecurity (9.23%) is uniquely elevated in Borno State due to the legacy of insurgency, which disrupts market access, reduces mobility, and discourages investment in dairy enterprises.

Low selling prices (5.96%) reflect weak bargaining power and an unorganized market structure, where minimal coordination among actors leads to price instability and exploitation by middlemen. Nigeria's heavy reliance on imported dairy products further depresses the competitiveness of locally produced milk (FAO, 2016). Lack of packaging materials (5.94%) and processing facilities (3.51%) limit value addition, forcing marketers to sell raw milk rapidly at lower prices rather than transforming it into higher-value products with extended shelf life (Iyiola-Tunji et al., 2019). Seasonal demand fluctuations (5.50%) reflect climatic variability affecting milk output, particularly during the dry season when feed scarcity reduces milk yield while demand remains relatively constant (NIPC, 2020).

4. CONCLUSION AND RECOMMENDATIONS

This study established that fresh milk marketing in Borno State is dominated by young, female, married, and largely uneducated Fulani women engaged in the marketing of three traditional dairy products: Kindirmo, Nono, and Madara. Yoghurt (Kindirmo) constitutes the most commercially significant product by volume (44.70%), driven by consumer preferences, its natural preservation advantages, and compatibility with informal, non-refrigerated transport systems. Fresh whole milk (Madara), despite commanding the highest unit price, is the least marketed due to its perishability.

The principal constraints to fresh milk marketing include lack of storage facilities, milk spoilage, poor road infrastructure, limited access to credit, and insecurity. Collectively, these constraints limit marketing efficiency, depress marketer incomes, and constrain the scalability of the dairy trade.

Based on these findings, the following recommendations are made: government and development partners should invest in

decentralized cold chain infrastructure and communal storage facilities to reduce spoilage losses; rural road rehabilitation should be prioritized to reduce transaction costs and expand market access; targeted credit programmes tailored to informal dairy marketers should be developed; and investments in small-scale processing equipment could incentivize value addition, expanding the Kindirmo and Nono marketers' profitability. Addressing insecurity remains a prerequisite for all other marketing improvements in the region.

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