

Price Discovery, Consumer Behaviour and Market Performance in Livestock Markets in Turkana County, Kenya

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Abstract: Livestock markets are central to pastoral livelihoods in Turkana County, Kenya, yet weak price discovery, inadequate market information, unequal bargaining power, limited affordability and high transaction costs constrain the benefits of livestock commercialization. This study examines the relationship between pricing strategies, consumer behaviour and market performance in selected secondary livestock markets in Turkana County. A mixed-methods, non-experimental design was employed, drawing quantitative evidence from 168 livestock traders in Kerio, Lorugum and Lokori markets and qualitative evidence from government and civil-society stakeholders and market observations. Quantitative data were analysed using descriptive statistics, reliability analysis, analysis of variance and non-parametric tests where appropriate, while qualitative evidence was used for triangulation and thematic interpretation. The results demonstrate substantial weaknesses in price discovery and price-setting practices. Overall, 54.0% of traders disagreed or strongly disagreed that livestock prices were well discovered and set, while 51.6% expressed negative views regarding the methods used to determine prices. Similarly, approximately 52.0% reported inadequate dissemination of pricing information. Consumer affordability and satisfaction were also major concerns: 71.5% negatively assessed the affordability of livestock and prices, 63.0% negatively assessed meat-product affordability, and 71.3% disagreed that consumers were satisfied with prevailing pricing strategies. At the same time, 65.3% reported strong consumer presence, indicating a gap between potential demand and effective purchasing capacity. Significant differences were observed among the three markets in supply-demand and pricing-related scores, $F(2,165) = 25.124$, $p < .001$, with Lorugum recording substantially lower scores than Kerio and Lokori. Qualitative findings indicate that prices are predominantly established through buyer-seller negotiation, visual assessment and physical examination, with limited adoption of standardized grading and live-weight pricing. The findings demonstrate that livestock-market performance is shaped by the interaction of pricing practices, information asymmetry, bargaining power, competition, consumer purchasing capacity, infrastructure, transaction costs and seasonal conditions. The study concludes that improving market performance requires a market-systems approach centred on transparent and evidence-based price discovery rather than administrative price fixing. Priority interventions include regular market-price information systems, standardized grading, progressive adoption of live-weight pricing, stronger producer and trader organizations, improved competition, reduced transaction costs, better market connectivity, consumer-responsive market segmentation and value addition. These measures can strengthen price transparency, improve bargaining outcomes and support more competitive, commercially viable and consumer-responsive livestock markets in Turkana County.

Keywords: Livestock markets; Pricing strategies; Price discovery; Consumer behaviour; Market performance; Pastoralism; Turkana County; Drylands; Kenya.

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Introduction

Livestock occupies a distinctive position in Kenya's drylands, where it serves multiple production, economic, food-security, social, and cultural functions. In Turkana County, livestock is more than an agricultural commodity; it is deeply embedded in household livelihoods, social relations, and local economic institutions. The livelihood significance of livestock makes the functioning of livestock markets particularly important because the conditions under which animals are exchanged directly influence household incomes, purchasing power, and access to animal-source foods. Consequently, understanding livestock-market performance requires attention not only to the prices received and paid, but also to the processes through which prices are discovered, communicated, negotiated, and translated into

purchasing decisions. In Turkana, concerns relating to weak price coordination, inadequate market information, affordability constraints, and differences in traders' financial capacity may affect the efficiency and inclusiveness of livestock-market transactions. Against this background, this study focuses on a specific and empirically relevant question: how do pricing strategies shape consumer behaviour and market performance in selected livestock markets in Turkana County?

Despite the central role of livestock in livelihoods, food security, and income generation, livestock markets in Turkana continue to operate within challenging economic, institutional, climatic, and market conditions. Previous evidence indicates that drought, insecurity, livestock-production conditions, and access to

market information influence pastoralists' decisions about when, where, and under what conditions to sell their animals. Institutional weaknesses and market-related risks may further constrain the benefits that producers and other market participants derive from commercialization. However, relatively limited attention has been given to the specific ways in which pricing strategies particularly informal price negotiation, information asymmetry, variation in price-setting practices, and differences in traders' financial capacity shape consumer purchasing behaviour and market performance. Examining these relationships is important because pricing is not simply an outcome of market exchange; it is also a mechanism through which information, bargaining power, affordability, and market incentives are transmitted among market participants.

Pricing conditions can influence both sellers' returns and consumers' purchasing decisions. Where prices are negotiated under conditions of limited information or unequal bargaining power, sellers may receive prices that do not adequately reflect animal characteristics, quality, or prevailing demand. At the same time, consumers may respond to price differences, affordability constraints, perceived value, and available information by adjusting the type, quantity, timing, or location of their purchases. These interactions can influence transaction volumes, market participation, competitiveness, efficiency, and ultimately overall market performance. The resulting knowledge gap concerns not merely the level of livestock prices, but the relationship between pricing practices, consumer responses, and the functioning of livestock markets in a dryland context such as Turkana.

The study therefore examined the influence of pricing strategies and consumer behaviour on market performance in selected livestock markets in Turkana County, Kenya. Specifically, it sought to: (i) assess the pricing strategies used in livestock markets in Turkana County; (ii) examine consumer behaviour and its influence on livestock purchasing decisions; (iii) assess the relationship between pricing practices and livestock-market performance; and (iv) identify institutional and market factors influencing price discovery and market performance. By examining these dimensions together, the study provides an integrated perspective on how pricing processes and consumer responses interact to shape the performance of livestock markets in Turkana County.

3. Methods

The study employed a mixed-methods, non-experimental design. The quantitative component covered 168 livestock traders, with 56 respondents sampled from each of three secondary markets: Kerio, Lorugum and Lokori. Qualitative evidence was obtained through interviewing 16 government and civil-society personnel and through market observation. The questionnaire contained closed and open-ended items, while the interview schedule used open-ended strategic questions. The research instrument demonstrated good reliability, with Cronbach's alpha values ranging from 0.792 to 0.883 across the study dimensions and an overall alpha of 0.832, indicating good internal consistency. The test-retest reliability coefficient of 0.821 further confirmed the stability of the instrument over time. Overall, the instrument was sufficiently reliable for use in the study.

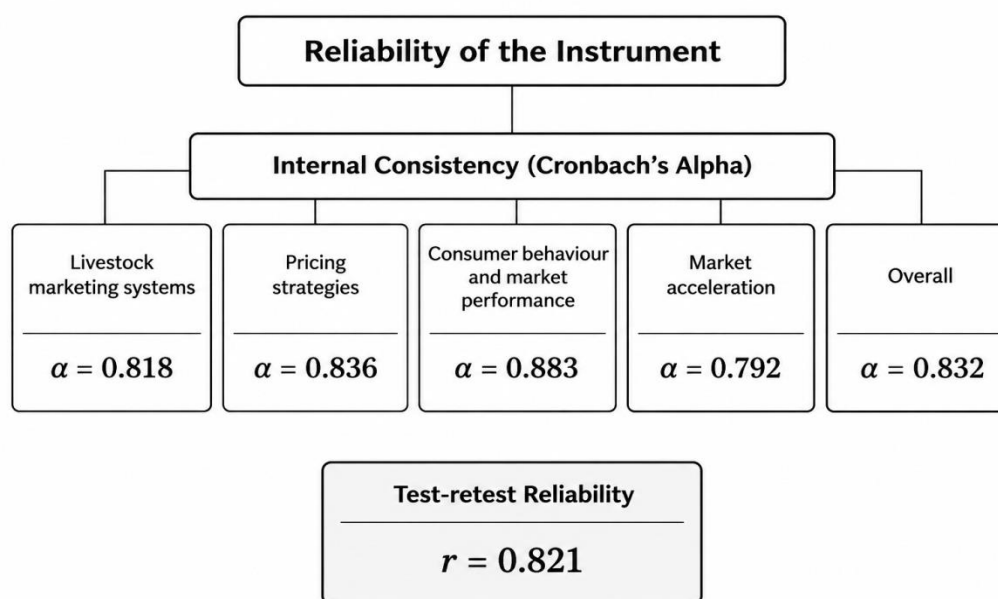


Figure 1: Reliability of Study Instruments. Source: Researcher made.

Descriptive statistics were used to summarize respondent characteristics and Likert-scale responses. Differences among markets were examined using ANOVA where appropriate and Kruskal-Wallis tests with post-hoc comparisons where normality and homogeneity assumptions were not satisfied. The level of statistical significance was set at 5%. Because the design was non-experimental and cross-sectional, findings are interpreted as associations and perceived effects rather than definitive causal effects.

Literature Review

Livestock Markets, Market Access and Economic Importance

Livestock markets are central to the economic and livelihood systems of pastoral communities in Turkana County, where livestock function simultaneously as productive assets, sources of food, stores of wealth, and means of exchange. The economic importance of pastoralism extends beyond the direct value of livestock sales to include employment, food security, cultural functions, and ecosystem-related benefits (Nyariki &

Amwata, 2019). However, the performance of livestock markets is strongly influenced by the interaction between pricing mechanisms, consumer preferences, trader behaviour, market access, and the availability of market information.

In Turkana, livestock market access is constrained by remoteness, inadequate infrastructure, limited market information, and high transaction costs, which weaken the bargaining position of pastoral producers (Watson & van Binsbergen, 2008). More recent evidence suggests that these structural constraints continue to influence livestock marketing decisions and market outcomes in dryland economies (Abebe et al., 2025; International Livestock Research Institute [ILRI], 2025).

Consequently, understanding pricing, consumer behaviour and market structures is important for explaining differences in market participation, price formation, competitiveness and overall market performance in Turkana County. The literature further indicates that market access is affected by long distances, poor roads, transport constraints, insecurity, limited market infrastructure and inadequate market information, all of which can increase the costs associated with selling livestock (Watson & van Binsbergen, 2008; Anno et al., 2023).

Livestock Pricing, Animal Characteristics and Bargaining Power

Pricing in pastoral livestock markets is rarely determined by production costs alone. Instead, prices emerge through negotiations between sellers and buyers in markets characterized by heterogeneous animals, asymmetric information, variable demand and uneven bargaining power. Abebe et al. (2025) found that livestock marketing among pastoralists and agro-pastoralists is influenced by market conditions, access to markets, herd characteristics and factors affecting the quantity of livestock supplied. In Turkana, pricing is further complicated by differences in animal condition, age, sex, breed, body size and perceived suitability for particular uses. Traders may therefore apply differentiated prices according to animal quality and expected resale value, while producers may accept lower prices when facing urgent cash requirements or deteriorating forage conditions.

Roba et al. (2019), examining the pastoral small-ruminant value chain in northern Kenya, found that local traders operate under difficult commercial conditions and that apparently high margins do not necessarily translate into substantial profits after transaction costs and risks are considered. This suggests that livestock price analysis should distinguish between gross price margins and the actual economic returns received by different market participants. The literature also indicates that differences in access to capital, market information, transport and external markets can create asymmetric bargaining relationships, particularly where producers have limited knowledge of prevailing prices or alternative outlets (Anno et al., 2024).

Competitive Rivalry and Livestock Market Performance

Competitive rivalry among traders is an important determinant of livestock prices and market performance in Turkana. Competition can potentially benefit producers by increasing the number of buyers, strengthening bidding processes and improving price discovery. However, excessive or poorly structured competition may also generate undesirable outcomes, particularly where traders compete aggressively for limited supplies or seek to establish market power through informal

arrangements. Anno and Pjero (2021) found that trader competitive rivalry influences supply-and-demand relationships in livestock markets in Kenya's drylands, indicating that the nature and intensity of competition can affect market equilibrium and the incentives of market participants.

Similarly, Anno et al. (2023) established that competition and market-access factors influence the performance of secondary livestock markets in Turkana. The number and behaviour of traders, access to alternative buyers, transaction volumes and barriers to market entry can therefore collectively determine whether competition results in better prices and more efficient market outcomes. The relationship between competition and pricing becomes particularly important where traders possess greater access to capital, information, transport and external markets than pastoral producers.

Anno et al. (2024) consequently argue that competition in Turkana livestock markets needs to be maintained within appropriate limits, suggesting the importance of fair and transparent competition rather than competition that undermines orderly market functioning. Improving price information, strengthening producer bargaining capacity and reducing artificial barriers to market entry can enable producers to compare competing offers and improve the quality of price discovery (Anno & Pjero, 2021; Anno et al., 2023, 2024).

Consumer Behaviour, Preferences and Livestock Demand

Consumer behaviour plays an important role in livestock price formation because animals are purchased for different purposes, including slaughter, breeding, herd replacement, resale, ceremonies and household consumption. Buyers consequently attach different values to animals depending on their intended use, market segment and expectations of future returns. Urbanization and changing food-consumption patterns can increase and diversify demand for animal-source foods, creating opportunities for pastoral producers to commercialize livestock production (Hatab et al., 2019; International Livestock Research Institute [ILRI], 2022).

For Turkana producers, however, increased demand does not automatically translate into higher producer prices because the benefits depend on market connectivity, transportation costs, intermediary structures and the ability of producers to supply livestock in appropriate quantities, qualities and time periods. Consumer preferences are also closely connected to perceptions of animal quality. Buyers may differentiate livestock according to body condition, size, age, sex, breed, health status and suitability for specific markets. Producers who understand these preferences may therefore adjust their production and marketing decisions to target particular market segments.

This creates an important connection between consumer behaviour and pricing strategy because the price received by a pastoralist may depend not only on prevailing market prices but also on how closely the characteristics of the animal correspond to buyer requirements. Abebe et al. (2025) emphasize the importance of livestock characteristics and marketing conditions in determining supply decisions, while Ndiritu and Gichuki (2025) demonstrate that pastoralists' participation in livestock markets varies according to seasonal and risk conditions.

Climate Risk, Transaction Costs and Producer Returns

Drought and weather-related risks constitute an important link between consumer behaviour, pricing strategies and livestock

market performance in Turkana. Abay et al. (2020) found that market access and weather risk influence livestock production decisions in Ethiopia, while Ndiritu and Gichuki (2025) show that drought conditions influence pastoralists' decisions to participate in livestock markets in Kenya's arid and semi-arid regions. When drought reduces pasture and water availability, pastoralists may increase livestock sales even when market prices are relatively unfavourable. This can increase livestock supply at a time when animals are losing condition, thereby weakening producers' bargaining power. At the same time, declining animal condition may reduce the prices that producers can obtain while increasing their need to sell livestock to finance household consumption and preserve remaining herds.

ILRI (2022; 2025) similarly identifies drought, disease, market-access constraints, price volatility and other commercial risks as important challenges affecting livestock marketing in African drylands. Effective pricing strategies therefore need to account for seasonal supply fluctuations and risk rather than relying on static prices throughout the year. Market prices must also be considered alongside transaction costs when assessing producer returns. A producer who receives an apparently attractive price may nevertheless obtain a low net return after deducting transport, trekking, brokerage, market fees, food and other selling costs. Roba et al. (2019) similarly demonstrate that transaction costs and operational risks can substantially reduce the profitability of livestock traders.

Market performance should therefore be assessed using a broader set of indicators, including producer prices, trader margins, transaction costs, turnover, volumes traded, market participation and profitability, rather than relying solely on nominal livestock prices. These considerations are particularly relevant in Turkana, where poor roads, long distances, insecurity and limited market infrastructure can increase the costs and risks associated with livestock marketing (Anno et al., 2023; Watson & van Binsbergen, 2008).

Institutional and Policy Frameworks and the Research Gap

Institutional and policy arrangements are important for improving pricing efficiency and developing consumer-responsive livestock markets. Kenya's Livestock Policy recognizes the importance of efficient livestock marketing systems, improved market infrastructure, stronger value-chain linkages and enhanced competitiveness within the livestock sector (Ministry of Agriculture, Livestock, Fisheries and Cooperatives [MALF&C], 2020). At the national level, the livestock sector remains economically significant, contributing to employment, household incomes, food security and wider economic activity (Kenya National Bureau of Statistics [KNBS], 2025). In Turkana, however, policy implementation needs to account for the distinctive characteristics of pastoral markets, including livestock mobility, seasonal production, dispersed supply, cross-border trade, insecurity and limited infrastructure.

Market information systems, transparent weighing and grading, improved market facilities, producer organizations, accessible financial services and stronger connections between pastoral producers and high-value consumers could improve price discovery and reduce information asymmetries (Anno & Pjero, 2021; Anno et al., 2023, 2024). Overall, the literature demonstrates that pricing strategies, consumer behaviour, competitive rivalry and market performance in Turkana livestock markets are

interconnected rather than independent phenomena. Pricing outcomes reflect the interaction of livestock quality, consumer demand, trader competition, market information, producer bargaining power, climatic conditions, transaction costs and access to alternative markets.

Existing studies provide substantial evidence on livestock marketing constraints, competition, market access, drought-related decisions and trader profitability in Turkana and comparable dryland systems (Ndiritu & Gichuki, 2025; Roba et al., 2019). Nevertheless, an important research gap remains regarding how consumer preferences and willingness to pay interact with trader pricing strategies and competitive structures to determine producer-level market performance in Turkana. Future research should therefore examine price differentiation according to animal characteristics, consumer segmentation, information asymmetry, bargaining processes, seasonal price dynamics and the relationship between competition and producer welfare. Such evidence can contribute to the development of transparent, competitive, consumer-responsive and commercially viable livestock markets in Turkana County.

Livestock Pricing Interventions in Dryland Areas

Livestock pricing interventions in dryland areas increasingly focus on improving price transparency, market information, quality-based payment systems, and producers' bargaining power, rather than attempting to administratively fix livestock prices. In Kenya's pastoral drylands, digital and community-based market information systems can provide producers and traders with more timely information on prevailing prices, livestock condition and market demand. For example, KAZNET has demonstrated the feasibility of collecting high-frequency livestock market data across remote pastoral markets, including price information differentiated by animal body condition (Chelanga et al., 2022; Shikuku, 2025). Similarly, evidence from northern Kenya shows that transparent, weight-based pricing can provide pastoralists with clearer signals about the value of their animals and reduce information disadvantages in transactions (Northern Rangelands Trust [NRT], 2020).

More recent evidence indicates that access to market information is associated with livestock market participation, while informal networks such as neighbours, family members and local traders remain important sources of market intelligence during drought periods (Ndiritu & Gichuki, 2025). Consequently, effective pricing interventions should combine digital information platforms with locally accessible communication channels, producer organizations, market infrastructure and mechanisms that enable producers to compare offers before selling. A second important intervention is the transition from undifferentiated livestock pricing toward quality- and value-based pricing. In Kenya's Kerio Valley, quality-based payments are influenced by the organization and financing of the value chain, market-system development, and how buyers and sellers define livestock quality; seasonality and security conditions also affect the feasibility of such systems (Mugonya & Hauser, 2022).

Recent research from South Omo similarly shows that weak market information, fragmented coordination and the strong influence of brokers can create information asymmetries that affect price formation and producers' bargaining positions (Abebe et al., 2026). Evidence from pastoral and agro-pastoral areas of Ethiopia further indicates that price advantage is an important factor in

market choice, while access to market information, credit and market infrastructure influences livestock sales (Abebe et al., 2025). In Kenya's ASALs, therefore, pricing interventions can include standardized grading and weighing, transparent price dissemination, collective marketing, negotiated quality premiums, improved market infrastructure, and stronger linkages with formal buyers. These measures are particularly important during drought, when distress sales can weaken producers' bargaining position and reduce the value realized from livestock assets.

Conceptual framing

Price discovery in livestock markets is a function of commodity characteristics, information, bargaining power, transaction costs, competition and expectations about downstream demand. In pastoral markets, animal heterogeneity makes price discovery more complex than in standardized commodity markets. Buyers may assess body condition, age, sex, breed, health status and expected carcass value. When objective measures are weak,

information asymmetry can increase bargaining advantages for actors with greater capital and market knowledge. The original study therefore appropriately treats price alongside supply, demand, business capital, stakeholder relationships and policy regulation rather than as an isolated variable.

This framing is supported by evidence from dryland livestock systems. Abay et al. (2020) demonstrate the interaction between market access, weather risk and livestock production decisions in Ethiopia, while Roba et al. (2019) show that local traders in northern Kenya operate under economic constraints that shape profitability. More recent Kenyan research shows that competition and market access are significant determinants of secondary-market performance in Turkana (Anno et al., 2023), and that rivalry can be managed through stronger local trader capabilities and more structured market institutions (Anno et al., 2024).

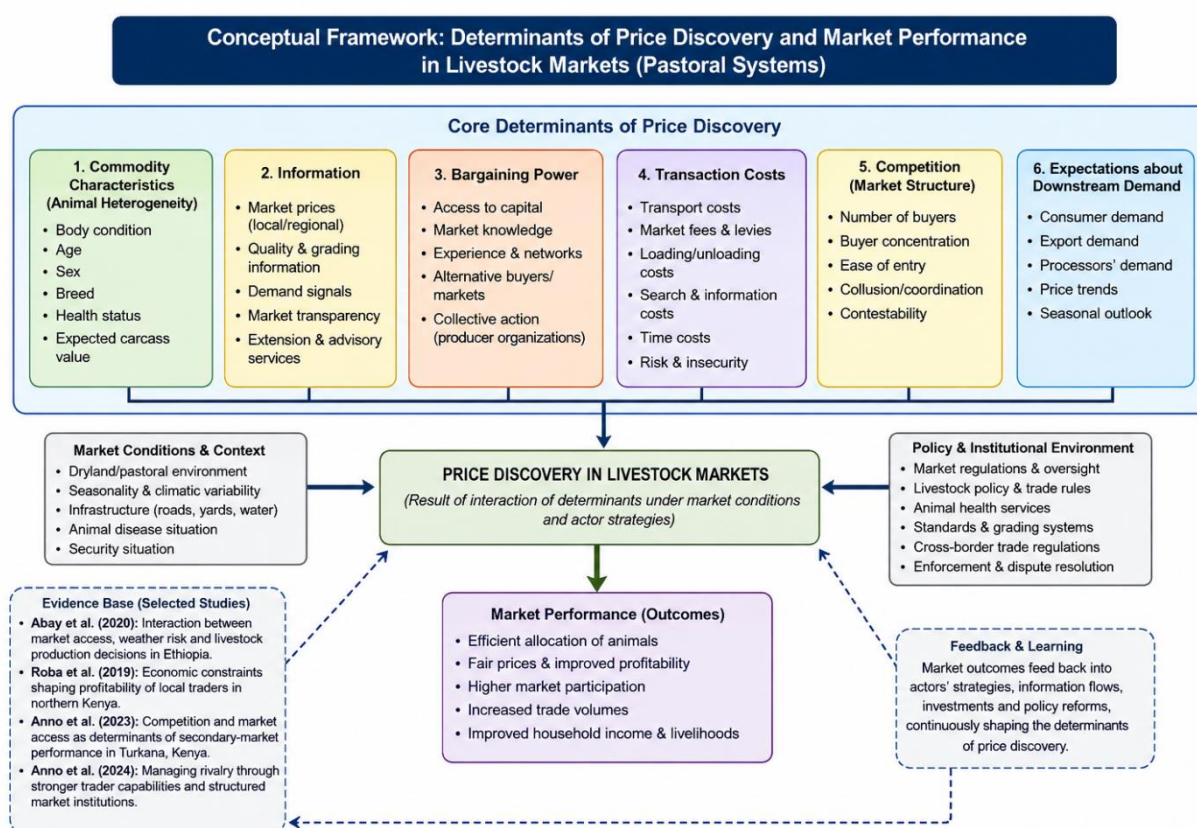


Figure 2: Conceptual Framework. Source: Researcher made.

Results

Quantitative Results

Respondent Characteristics

The quantitative analysis was based on 168 livestock traders, comprising equal numbers of respondents from Kerio, Loruugum and Lokori secondary livestock markets, with 56 traders sampled from each market. The respondents had a mean age of 35.09 years (SD = 8.43), indicating that livestock trading was largely undertaken by economically active adults with substantial exposure to livestock-market transactions. The predominance of male respondents was pronounced, with 84.8% (approximately 143 traders) being male and approximately 15.2% (25 traders) being female. This gender composition suggests that livestock trading in

the study markets remains strongly male dominated, although the participation of women indicates some degree of gender inclusion in market activities.

Educational attainment was generally low. Approximately 73.7% (124 respondents) reported being non-literate, while only 6.3% (about 11 respondents) had attained certificate-level education. The relatively limited formal education of traders is important for interpreting the functioning of market-information systems because written price bulletins, formal market reports and other information products may not be equally accessible to all market participants. Nevertheless, respondents possessed substantial experiential knowledge.

The average duration of livestock marketing experience was 13.1 years, suggesting that many traders had accumulated

considerable tacit knowledge concerning animal valuation, seasonal demand, buyer preferences and negotiation practices. In addition, 94.87% (approximately 159 respondents) were themselves livestock keepers. The overlap between livestock ownership and trading indicates that the distinction between producers and traders is relatively fluid in the study area and that many market participants combine production and commercial activities.

Reliability and Internal Consistency of the Quantitative Measures

The measurement instruments demonstrated satisfactory to very good internal consistency. Cronbach's alpha coefficients were 0.818 for livestock marketing systems, 0.836 for pricing strategies, 0.883 for consumer behaviour and market performance, 0.792 for market acceleration, and 0.832 for the overall instrument. These coefficients are above the commonly applied threshold of 0.70, indicating that the items within the respective constructs were sufficiently correlated to provide reliable composite measures.

The strongest internal consistency was recorded for the consumer behaviour and market performance construct ($\alpha = 0.883$), followed by pricing strategies ($\alpha = 0.836$) and the overall instrument ($\alpha = 0.832$). The market-acceleration construct recorded the lowest coefficient ($\alpha = 0.792$), but this remained within an acceptable range. The test-retest reliability coefficient of 0.821 further indicates good temporal stability of the instrument. Consequently, the observed differences in pricing perceptions across markets are unlikely to be attributable primarily to poor measurement reliability.

Price Discovery and Price-Setting Practices

The quantitative evidence indicates substantial weaknesses in the formal discovery and communication of livestock prices. Of the 168 respondents, 33.9% strongly disagreed that livestock prices were well discovered and set, while a further 20.1% disagreed. Thus, approximately 54.0% of respondents expressed a negative assessment of existing price-discovery arrangements. In approximate numerical terms, this corresponds to about 57 traders strongly disagreeing and 34 disagreeing, meaning that approximately 91 respondents did not consider the prevailing price-discovery process satisfactory.

The proportion agreeing with the statement was consequently much smaller than the proportion expressing dissatisfaction. Only the remaining respondents selected neutral or positive response categories, indicating that confidence in existing price-setting arrangements was limited. The results are particularly important because livestock markets involve heterogeneous animals whose value varies according to characteristics such as species, breed, age, sex, body condition, health status and intended use. Where objective pricing benchmarks are unavailable, differences in individual assessment and negotiating ability can therefore have substantial implications for transaction prices.

A similar pattern was observed regarding the quality of methods used to set livestock prices. Approximately 35.6% strongly disagreed and 16.0% disagreed that the methods used to determine prices were good. The combined negative response was therefore 51.6%, equivalent to approximately 87 traders. About 60

The relationship can be summarized as follows:

respondents strongly disagreed, while approximately 27 respondents disagreed. The fact that more than half of the sample evaluated existing price-setting methods negatively provides quantitative support for the qualitative finding that transactions are predominantly based on negotiation, physical inspection and palpation rather than standardized objective measurement.

Price-information dissemination was also weak. Approximately 27.0% strongly disagreed and 25.02% disagreed that pricing information was adequately shared. Combined, about 52.02% of respondents expressed a negative view of price-information sharing, representing approximately 87 traders. This finding is particularly significant because information sharing constitutes an essential component of competitive price discovery. Where more than half of market participants perceive price information as inadequately disseminated, traders and sellers may enter negotiations with different levels of knowledge regarding prevailing prices and alternative market opportunities.

Taken together, the three indicators reveal a consistent quantitative pattern: more than half of respondents expressed negative perceptions regarding price discovery, price-setting methods and the sharing of pricing information. The convergence of these indicators strengthens the interpretation that pricing problems in the study markets are institutional and informational rather than simply the result of temporary price fluctuations.

Affordability and Consumer Demand

The results demonstrate a notable tension between perceived consumer demand and affordability. Regarding whether livestock and their prices were affordable, 41.0% strongly disagreed and 30.5% disagreed. The combined negative response was therefore 71.5%, equivalent to approximately 120 of the 168 respondents. Approximately 69 traders strongly disagreed, while about 51 traders disagreed. Thus, more than seven out of every ten respondents considered livestock prices and/or livestock affordability problematic.

The same pattern was evident for meat products. Approximately 37.0% strongly disagreed and 26.0% disagreed that meat products were affordable. The combined negative response of 63.0% corresponds to approximately 106 respondents. This suggests that affordability constraints extend beyond live-animal transactions to downstream livestock products. From a market-performance perspective, this is important because high prices may increase the nominal value of transactions while simultaneously reducing the number or frequency of consumers able or willing to purchase.

However, the findings do not indicate an absence of demand. On the contrary, 43.0% strongly agreed and 22.3% agreed that there were many consumers for livestock and livestock products. The combined positive response of 65.3% represents approximately 110 respondents. The quantitative evidence therefore reveals an important market paradox: consumer demand was perceived to be relatively strong, but affordability was perceived to be weak. This suggests that the principal constraint may lie in the conversion of potential demand into effective purchasing activity rather than in the absence of consumers.

Perceptions on Pricing and Market Conditions

Indicator	 Strongly disagree	 Disagree	 Combined negative response	 Strongly agree	 Agree	 Combined positive response
 Livestock prices well discovered and set	33.9%	20.1%	54.0%	–	–	–
 Methods of price setting are good	35.6%	16.0%	51.6%	–	–	–
 Pricing information is shared	27.0%	25.02%	52.02%	–	–	–
 Livestock/prices are affordable	41.0%	30.5%	71.5%	–	–	–
 Meat products are affordable	37.0%	26.0%	63.0%	–	–	–
 Many consumers exist	–	–	–	43.0%	22.3%	65.3%

Figure 3: Livestock pricing perceptions. Source: Researcher made.

Consumer Satisfaction with Pricing Strategies

Consumer satisfaction provided additional evidence of weaknesses in the prevailing pricing system. 41.76% of respondents strongly disagreed that consumers were happy or delighted with existing pricing strategies, while 29.54% disagreed. The combined negative response was therefore 71.30%, representing approximately 120 respondents out of the 168 traders. In other words, roughly seven in every ten traders perceived consumers as dissatisfied with the existing pricing arrangements.

A related item examined whether pricing positively affected consumers. Here, 31.87% strongly disagreed and 28.53% disagreed, producing a combined negative response of 60.40%, or approximately 101 respondents. This result is consistent with the affordability findings and suggests that the prevailing pricing system may be limiting the ability of consumers to participate fully in the market.

The quantitative evidence therefore indicates a three-stage pattern. First, there is substantial perceived consumer demand (65.3% positive). Second, there is substantial concern about affordability (71.5% negative for livestock and 63.0% negative for meat). Third, there is low perceived consumer satisfaction (71.3% negative). The combination suggests that consumers may be present and interested in livestock products but face prices that constrain their purchasing behaviour. This provides empirical support for considering consumer purchasing power and willingness to pay as important components of livestock-market performance.

Market-Level Differences in Pricing and Supply-Demand Conditions

The analysis further demonstrated substantial spatial variation among the three livestock markets. The overall mean score for the supply-demand balance and pricing theme was 3.50. However, the market-specific means differed considerably: Kerio recorded a mean of 3.74, Lorugum 2.93 and Lokori 3.82. The range between the highest and lowest market means was therefore

0.89 scale points, indicating meaningful variation in perceived pricing and market-balance conditions.

An analysis of variance confirmed that these differences were statistically significant, $F(2,165) = 25.124$, $p < .001$. The null hypothesis that the three markets had equal mean scores was therefore rejected. The corresponding effect-size estimate based on the reported F statistic is approximately $\eta^2 = 0.233$, indicating that roughly 23.3% of the variance in the composite market-level score is statistically associated with differences among the three markets. This represents a substantial market-level differentiation and strengthens the argument that pricing conditions in Turkana cannot be assumed to be spatially homogeneous.

The post-hoc Tukey analysis provided further detail. There was a statistically significant difference between Kerio and Lorugum ($p < .001$) and between Lorugum and Lokori ($p < .001$). In contrast, the difference between Kerio and Lokori was not statistically significant ($p = .842$). The pattern indicates that Lorugum constitutes the principal point of differentiation in the sample, whereas Kerio and Lokori exhibited statistically similar scores.

The market means can therefore be ranked as: Lokori (3.82) > Kerio (3.74) > Lorugum (2.93). This ranking should not be interpreted as evidence that Lokori or Kerio is universally the "best-performing" market because the composite score represents perceptions of the specific supply–demand/pricing construct rather than a direct measure of profitability or price efficiency. Nevertheless, the statistically significant differences demonstrate that traders experience materially different pricing and market-balance conditions depending on where they operate.

Integrated Quantitative Interpretation

The quantitative results reveal four interconnected characteristics of livestock markets in Turkana. First, price discovery is weak, with 54.0% of respondents negatively assessing the discovery and setting of prices, 51.6% negatively assessing price-setting methods, and approximately 52.0% negatively assessing price-information sharing. Second, affordability is a major constraint, with 71.5% expressing a negative assessment of

livestock affordability and 63.0% expressing a negative assessment of meat-product affordability. Third, consumer demand exists but is not fully translated into effective market demand, as 65.3% reported many consumers while 71.3% perceived consumers as dissatisfied with existing pricing strategies. Fourth, pricing and supply-demand conditions differ significantly across markets, with Lorugum exhibiting substantially lower scores than Kerio and Lokori.

These results collectively suggest that the central problem is not simply that livestock prices are high or low. Rather, the evidence points to a market-coordination problem involving price discovery, information dissemination, affordability and spatial differences in market functioning. The high proportion of traders reporting weak price discovery indicates that transaction prices may be heavily influenced by individual bargaining processes. At the same time, the high proportion reporting affordability problems suggests that prices may not always align with local purchasing power. The simultaneous presence of strong reported demand and low affordability therefore indicates a gap between potential demand and effective demand.

The statistically significant market differences provide an additional indication that these problems are shaped by local market conditions. Differences in trader competition, livestock supply, consumer concentration, accessibility, transport costs, infrastructure, market linkages and information flows may contribute to the observed variation. The especially low mean recorded in Lorugum suggests that market-specific constraints warrant particular investigation rather than assuming that interventions designed for Kerio or Lokori will automatically generate equivalent outcomes in Lorugum.

Overall, the quantitative evidence provides empirical support for a market-systems interpretation of pricing performance. Improving market outcomes is unlikely to result from price regulation alone. Instead, the evidence points toward interventions that improve the mechanisms through which prices are discovered and communicated, including standardized grading, progressive adoption of live-weight measurement, regular market-price reporting, stronger trader and producer organizations, improved competition and better connectivity with alternative and terminal markets. At the consumer end, differentiated animal grades, sizes, weights and product categories could help align livestock supply with different levels of purchasing power. The quantitative findings therefore support the broader conclusion that transparent price discovery, effective competition, consumer affordability and market-specific interventions are complementary requirements for improving livestock-market performance in Turkana County.

Qualitative Results

Informal Pricing, Animal Valuation and Negotiation

Qualitative evidence from interviews with government and civil-society stakeholders, together with observations of market transactions, indicated that livestock pricing in Turkana County remains predominantly informal and negotiation-based. Buyers and sellers commonly determine prices through direct bargaining, supported by visual assessment, physical examination and palpation of animals. Stakeholders indicated that buyers consider characteristics such as body size, body condition, age, sex, breed, health status and the intended use or resale potential of an animal when making offers.

Although some markets have adopted informal classification into grades such as G1, G2 and G3, these practices are not consistently standardized across markets. Consequently, the final price often reflects the bargaining abilities, experience, information and financial position of the parties involved rather than a uniformly applied objective pricing system. The qualitative evidence therefore reinforces the quantitative finding that formal price discovery remains weak and that market participants continue to depend heavily on individual judgement and interpersonal negotiation.

Market Information, Information Asymmetry and Bargaining Power

The interviews further revealed that limited access to timely and reliable market information contributes significantly to information asymmetry and unequal bargaining power. Stakeholders reported that traders with stronger networks, greater financial resources and better knowledge of prices in alternative or terminal markets are generally better positioned to negotiate favourable transactions. In contrast, livestock sellers may enter markets without adequate knowledge of prevailing prices or the prices being offered in competing locations.

This situation is particularly problematic during periods of drought or deteriorating livestock condition, when pastoral households may need to sell animals urgently to meet food and other household requirements. Under such circumstances, sellers have limited capacity to delay transactions or search for better-paying buyers. Qualitative evidence consequently suggests that weak information flows do not merely affect price transparency; they can directly influence the distribution of benefits from livestock commercialization by strengthening the bargaining position of better-informed market actors.

Consumer Demand, Affordability and Market Segmentation

A third qualitative finding concerned the relationship between prevailing prices, consumer affordability and market demand. Stakeholders recognized that demand for livestock and meat products exists in Turkana, particularly in urban centres and among hotels, households and other institutional consumers. However, high prices were perceived to constrain effective demand and, in some cases, encourage consumers to obtain meat or livestock products from neighbouring towns or alternative markets. This creates a potential form of market leakage in which local consumer expenditure does not remain within the local livestock-market system.

Interview evidence also suggested that consumers do not constitute a homogeneous market: their purchasing decisions vary according to purchasing power, preferred animal characteristics, quantity required and intended use. The qualitative findings therefore support the quantitative evidence of strong potential demand alongside weak affordability and consumer satisfaction. They indicate that improved market performance may require differentiated pricing and product offerings based on animal size, quality, grade and consumer purchasing capacity rather than reliance on a single undifferentiated market price.

Infrastructure, Seasonality and Institutional Constraints

Finally, stakeholders identified institutional, infrastructural and seasonal factors as important influences on pricing and overall market performance. Long distances, poor roads, limited transport options, insecurity, inadequate market facilities and other

transaction costs affect the ability of sellers and traders to move animals efficiently and access alternative buyers. These constraints can create substantial differences between markets, helping to explain the statistically significant variation observed among Kerio, Lorugum and Lokori. Stakeholders also indicated that drought and seasonal changes in livestock supply and condition can substantially alter bargaining relationships and prices. Although weighing animals by live weight was viewed as a potentially more objective approach to price determination, its adoption remains limited, partly because of inadequate infrastructure, limited stakeholder familiarity and the absence of sufficiently standardized grading systems.

Overall, the qualitative evidence points toward the need for a coordinated market-system approach combining regular price-information dissemination, standardized grading, progressive introduction of live-weight pricing, stronger producer and trader organizations, improved market infrastructure, lower transaction costs and better linkages to higher-value markets. Such measures would improve transparency and competition while preserving the flexibility of negotiated prices in heterogeneous pastoral livestock markets.

Discussion

The findings demonstrate that livestock pricing in Turkana County is shaped not only by supply and demand but also by market institutions, information access, bargaining power, competition, livestock characteristics and transaction conditions. A central finding is weak formal price discovery: 33.9% of traders strongly disagreed and 20.1% disagreed that prices were well discovered and set, while 35.6% strongly disagreed and 16.0% disagreed that existing price-setting methods were good. More than half also reported inadequate sharing of pricing information. In practice, prices are largely determined through negotiation, physical assessment and traders' individual knowledge, while live-weight pricing remains poorly adopted. This creates information asymmetries and allows traders with stronger networks, capital and market knowledge to gain an advantage over less-informed sellers.

The findings suggest that improving price transparency should focus on strengthening market information rather than administrative price fixing. Regular dissemination of prevailing prices, standardized grading, objective measurement and progressive adoption of live-weight pricing could improve price discovery while preserving negotiation. However, weighing and other technical solutions will require trader participation, suitable infrastructure, simple grading systems and demonstrable commercial benefits. Price information should therefore evolve toward a coordinated system covering market, species, sex, grade and, where feasible, live weight.

Affordability presents a second major market-performance challenge. Although 43% of respondents strongly agreed and 22.3% agreed that there were many consumers for livestock and livestock products, 41.0% strongly disagreed and 30.5% disagreed that livestock and their prices were affordable. Similar concerns were reported for meat products. More than 70% also disagreed that consumers were satisfied with existing pricing strategies. This indicates that potential demand does not necessarily translate into effective or sustained demand. Evidence that some hotels and households purchase meat from neighbouring towns when local prices are considered high further suggests market leakage. Market performance should therefore be assessed through purchasing

capacity, transaction frequency, sales volumes, repeat purchases, profitability and consumer satisfaction, rather than consumer numbers or nominal prices alone.

The significant differences among Kerio, Lorugum and Lokori further demonstrate that livestock-market conditions are spatially differentiated within Turkana. Mean scores were 3.74 in Kerio, 2.93 in Lorugum and 3.82 in Lokori, with the differences statistically significant, $F(2,165)=25.124$, $p<.001$. Differences in infrastructure, accessibility, trader networks, demand, supply, security, competition and links to terminal markets may explain these variations. County-wide interventions should therefore be adapted to market-specific conditions rather than applying uniform pricing or market-development measures. Competition can improve price discovery, but only where traders have reasonably balanced access to capital, information, transport and alternative markets.

Climate and transaction costs also strongly influence market outcomes. Drought, water scarcity, pasture deterioration and animal-health risks can force pastoralists to sell when livestock condition and prices are declining. At the same time, long distances, poor roads, insecurity, transport constraints, inadequate facilities and market charges increase transaction costs. Consequently, high observed prices do not necessarily translate into high net returns. Market performance should therefore be assessed through producer and trader profitability, transaction costs, market turnover, traded volumes, participation and consumer satisfaction.

The findings also point to opportunities for market segmentation. Consumers differ in purchasing power and preferences according to animal size, body condition, age, sex, breed, health status, weight and intended use. Differentiated grading, products and price points could serve different consumer segments while strengthening price signals and creating incentives for producers to improve animal health, nutrition and husbandry. Such approaches, however, depend on reliable grading, market information and linkages that communicate consumer preferences back to producers.

Overall, the findings support a market-systems interpretation of livestock pricing in Turkana. Price formation occurs at the intersection of production conditions, livestock quality, consumer demand, competition, information, infrastructure, finance, institutions and risk. Intervening in one dimension alone is unlikely to generate sustained improvement. A more effective approach would combine regular market-information collection and dissemination, objective measurement, standardized grading, improved infrastructure, stronger producer and trader organizations, lower transaction costs, market linkages and value addition.

The practical implication is that policymakers, market authorities, development organizations and market organizations should establish transparent price-information systems; pilot live-weight pricing and standardized grading in selected markets; use locally appropriate communication channels such as mobile platforms, radio and market boards; improve roads, market facilities and transport arrangements; and strengthen commercially oriented producer and trader organizations for aggregation, information sharing and negotiation with larger buyers. These measures address the institutional and structural causes of weak price discovery rather than attempting to regulate prices directly.

More broadly, livestock commercialization should be understood as the generation of sustainable returns for producers and traders while remaining affordable and responsive to consumers. Increasing sales or market participation alone does not necessarily improve welfare. The priority should therefore be to improve transaction quality, reduce information asymmetry, strengthen bargaining capacity, promote fair competition and connect producers to differentiated and higher-value markets. Because the study is cross-sectional and non-experimental, the observed relationships should be interpreted as associations rather than definitive causal effects, and findings from the three study markets should not be generalized mechanically to all livestock markets in Turkana. Nevertheless, the convergence of quantitative and qualitative evidence provides a strong basis for promoting more transparent, competitive, consumer-responsive and commercially oriented market institutions.

Conclusions and implications

This study concludes that pricing strategies are a critical determinant of livestock market performance in Turkana County because they connect livestock production, trader incentives, consumer demand and the broader functioning of market institutions. The evidence from 168 livestock traders in Kerio, Loru-gum and Lokori demonstrates that price discovery remains predominantly informal, negotiation-based and weakly coordinated. A substantial proportion of respondents expressed dissatisfaction with the way livestock prices are discovered, set and communicated, while qualitative evidence confirmed the continued reliance on buyer–seller negotiation, physical assessment and palpation, with limited adoption of live-weight pricing.

These conditions create opportunities for information asymmetry and unequal bargaining power, particularly where traders have greater access to capital, market networks, transport and information than livestock sellers. The findings therefore indicate that improving livestock-market performance in Turkana requires a transition from predominantly individualized price negotiation toward more transparent, objective and information-supported price discovery mechanisms without eliminating the flexibility of market-based negotiation.

The study further concludes that strong consumer demand does not necessarily translate into effective or sustainable market performance. Although a substantial proportion of traders reported the presence of many consumers for livestock and livestock products, affordability and consumer satisfaction were consistently weak. This indicates a disconnect between potential demand and consumers' capacity or willingness to purchase at prevailing prices. The reported movement of some hotels and households to neighbouring towns when local prices are considered high further demonstrates the possibility of market leakage and reduced local market activity. Pricing strategies should therefore be responsive not only to livestock supply and trader costs but also to consumer purchasing capacity, preferences and willingness to pay.

Differentiated livestock grades, animal sizes, weights and product categories could enable traders and producers to serve different consumer segments while creating clearer price signals. Such an approach could also strengthen incentives for producers to improve animal health, nutrition, body condition and other characteristics valued by buyers. The study consequently establishes consumer responsiveness and affordability as important dimensions of livestock-market performance alongside

conventional indicators such as prices, sales volumes and trader margins.

A further conclusion is that livestock-market conditions in Turkana are spatially differentiated and strongly influenced by competition, market access, transaction costs and climatic risk. The statistically significant differences among Kerio, Loru-gum and Lokori demonstrate that pricing and supply–demand conditions cannot be assumed to be uniform across the county. Loru-gum recorded a substantially lower mean score than Kerio and Lokori, while the latter two markets did not differ significantly, suggesting that differences in accessibility, infrastructure, trader networks, competition, demand, supply conditions and linkages to terminal markets may shape local market outcomes. These spatial differences are compounded by drought, deteriorating animal condition, water and pasture shortages, insecurity, transport constraints and other transaction costs.

During drought periods, pastoralists may be compelled to sell animals despite unfavourable prices, while declining animal condition may simultaneously reduce buyers' willingness to pay. Consequently, a high nominal selling price does not necessarily represent a high economic return. Market performance should instead be assessed more broadly through producer returns, trader profitability, transaction costs, turnover, traded volumes, consumer affordability, satisfaction and repeat transactions. This reinforces the conclusion that pricing cannot be addressed separately from the production, infrastructure, institutional and climatic conditions within which livestock markets operate.

Overall, the study concludes that sustainable improvement of livestock markets in Turkana requires an integrated market-systems approach rather than isolated price regulation or increased market participation alone. The priority should be to establish a transparent and regularly updated price-information architecture covering markets, species, sex, grade and, where feasible, live weight, while disseminating information through accessible channels such as mobile platforms, radio, market boards and local-language communication. Live-weight pricing and standardized grading should be introduced progressively through market pilots involving traders and other market participants, rather than imposed as stand-alone regulatory measures.

These measures should be complemented by stronger producer and trader organizations, improved roads and market facilities, lower transaction costs, stronger linkages to alternative and terminal markets, and market research capable of identifying consumer segments and higher-value opportunities. Importantly, pricing interventions should be integrated with animal health, feed, water, quality assurance and value-addition measures because livestock quality directly affects market value.

The study therefore concludes that commercialization in Turkana should be understood not simply as increasing the volume or frequency of livestock sales, but as creating transparent, competitive, consumer-responsive and commercially viable market institutions that generate sustainable returns for producers and traders while maintaining affordability for consumers. Given the cross-sectional and non-experimental design, these conclusions should be interpreted as evidence of relationships and market perceptions rather than definitive causal effects; nevertheless, the convergence of quantitative and qualitative evidence provides a strong basis for strengthening livestock-market institutions and

improving the quality and efficiency of livestock commercialization in Turkana County.

Recommendations

a. Establish a transparent, market-based price-discovery and information system.

Turkana County should develop a regular livestock price-information system covering major markets and relevant terminal markets, with prices disaggregated by species, sex, grade, animal characteristics and, where feasible, live weight. Information should be collected consistently and disseminated through mobile platforms, local radio, market boards, traders' networks and local-language channels. The objective should be to reduce information asymmetry and strengthen bargaining power without imposing administratively fixed prices.

b. Introduce objective livestock grading and progressively pilot live-weight pricing.

County authorities, market actors and private-sector partners should pilot standardized grading and live-weight pricing in selected markets, beginning with markets where the necessary infrastructure and stakeholder readiness exist. The pilots should be commercially driven and developed jointly with traders, producers and buyers to ensure that weighing and grading reduce disputes, improve price transparency and generate clear benefits for market participants. Independent verification should be incorporated to build confidence in the system.

c. Strengthen fair competition and collective market power.

Producer and trader organizations should be strengthened or established where commercially viable to facilitate collective marketing, price information, aggregation, negotiation and access to larger buyers. Market institutions should promote fair competition rather than simply increasing the number of traders. Particular attention should be given to reducing information and capital advantages that allow better-connected traders to exercise disproportionate bargaining power.

d. Reduce transaction costs and improve market connectivity.

Investments should prioritize market roads, livestock handling facilities, water points, holding grounds, loading facilities, transport services, security and predictable market-day arrangements. Stronger linkages between secondary markets such as Kerio, Lorugum and Lokori and larger terminal or urban markets should also be developed. Because market conditions differ significantly across locations, infrastructure and market-development investments should be based on market-specific assessments, rather than applying an identical intervention across Turkana.

e. Make pricing more consumer-responsive and promote market segmentation.

Market actors should undertake periodic consumer and demand assessments to understand purchasing power, willingness to pay, preferred animal characteristics and alternative sources of livestock and meat. Rather than relying on a single informal market price, traders should explore differentiated grades, animal sizes, weights, quality categories and product forms that can serve different consumer segments. Monitoring consumer affordability,

satisfaction, repeat purchases and market leakage should become part of routine market-performance assessment.

f. Integrate pricing with livestock productivity, quality and value addition.

Pricing interventions should be linked to animal health, feed and water availability, drought preparedness, husbandry, quality assurance and value addition because animal condition directly influences market value. During drought periods, market interventions should help reduce distress sales and protect livestock value through timely market information, strategic offtake, alternative markets and appropriate risk-management mechanisms. Value addition and stronger linkages to higher-value buyers should be promoted where commercially feasible.

Study limitations

The study was conducted in three secondary markets and therefore should not be generalized mechanically to all livestock markets in Turkana. The manuscript also contains inconsistencies in the description of the sampling frame and sample-size calculation; the article uses the 168-trader dataset that is consistently reported in the abstract, results and statistical tables, but the original sampling-frame text should be reconciled before journal submission. Finally, the cross-sectional non-experimental design supports inference about relationships and perceptions, not causal effects of a specific pricing intervention.

Disclaimer

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Interest Conflicts

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