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Factors Influencing Beef Cattle Marketing Behavior in Pastoral Areas of Kenya: The Role of Livestock Market Information

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Marketing transactions take place in an environment where information is shared and exchanged among and between sellers, buyers and middlemen. It is argued that traders and middlemen have a competitive advantage over producers in negotiating for prices, because the former have access to prices in both primary and terminal markets, while the latter only have limited access to prices in the primary markets. This Research Brief highlights the situation regarding access to livestock marketing information by producers in pastoral markets of Kenya. Results show that livestock marketing information was not accessible to producers from September 2004 to September 2005, and hence did not play a significant role in influencing market prices. Subsequent analyses also show that producers consider a number of attributes when pegging prices to their animals, and that these tally with the categorization system developed by the Livestock Information Network and Knowledge System (LINKS) project. Further findings suggest that past efforts to develop livestock marketing information systems have been dogged by limited capacity to provide information that is accurate, timely, reliable, and spatially coherent. This has been exacerbated by failure to effectively use existing media and complement these with emerging information communication technologies to disseminate the information. LINKS has since responded to these factors through improvements in geographical coverage, accuracy, reliability and timeliness in the overall livestock market information system, as well as through improved information dissmination systems; improvements that have strenghted LINKS, allowing it to function as the foundation for the National Livestock Marketing Information System in Kenya.

Background

Research has shown that livestock marketing information plays a significant role in improving the performance of pastoral production and marketing systems (Ndikumana et al. 2000; Aklilu et al. 2002; Mbogoh et al. 2005). More timely, accurate and reliable livestock information can lead to increased commercial livestock offtake and increased producer prices. These studies (ibid) hitherto have focused on the broad aspects of livestock markets in Kenya. Very little attention, however, has been given to examining specific aspects of livestock markets, such as what constitutes viable livestock marketing information.

This study was undertaken to analyze the factors that influence beef cattle marketing behavior in pastoral areas of Kenya, with emphasis on the role of livestock marketing information. For instance, although traders have indicated their considerations for some quality attributes in beef cattle sold in pastoral areas, these are not well documented. Moreover, there have been no precise estimates to quantify the value of these attributes. Specifically, the present study consists of three main components: 1) Identifying the existing sources of information and extent of their use by producers; 2) Identifying the physical attributes of beef cattle considered while selling animals; and 3) Evaluating the importance of these attributes in determining prices of animals offered for sale.

Information derived from the study will provide inputs to designers of livestock marketing information systems to improve their information formats to make them more effective and efficient in terms of having the capability of transmitting relevant, accurate, reliable, accessible and useful information. In addition, it provides information on attributes of beef cattle that are demanded by traders, an important factor in livestock marketing for pastoralists, should they have to respond to the needs of the market.

Methods

The study used two sets of data. The first set was sourced from a cross-sectional survey conducted using a questionnaire administered to 135 pastoral households from Garissa and Isiolo Districts. The second set was a 1,233 transactional survey data set collected between September 2004 and September 2005 from three livestock markets in Kenya: Nairobi, which is the main terminal market in Kenya, and two other pastoral markets (one in Garissa in the northeastern rangelands and one in Isiolo in the eastern rangelands). The samples

Table 1. Ranking of beef cattle attributes by respondents.

Attribute	Description	Rank	Respondents (n=132)	Percentage
Sex	Animal is male or female	1	131	94.9
Age	Immature (< 1 year), young (1-2 years), mature (>2 years)	2	109	79
Body condition	Muscle and fat distribution	3	100	72.5
Castration condition	Male castrated or not	4	58	42
Breed	Boran, Zebu, Sahiwal, Mixed	5	48	34.8
Breeding ability	Reproductive ability	6	32	23
Character	Aggressive or docile to people and other animals	7	21	15.2
Lactation	Level of milk production and milking length	8	18	13
Pregnancy status	Female in-calf or not	9	16	11.6

were based on beef cattle presented and sold in the three markets. The data were collected randomly in each of the markets by trained Livestock Information Network and Knowledge System (LINKS) project market monitors. The monitors visually assessed the beef animals on different characteristics, and interviewed traders on market transaction prices. The raw data were used to calculate the average prices, which were then sent to the LINKS central server via coded Short Message Service (SMS).

Preliminary Findings

Data from the cross-sectional survey were analyzed using descriptive statistics to generate frequencies. Results indicated that a majority of the respondents (73%) had access to radio, while 28%, 11% and 10% had access to a cellphone, newsprint and television respectively. To obtain information on livestock marketing, 75% of the respondents relied on their neighbors and their own personal visits to the market. On the need for price information from other markets, 77.8% of the respondents expressed a strong need, and out of these 32%, 54%, and 9% desired to have the information on weekly, monthly and quarterly basis respectively, while 5% were indifferent about the frequency. A total of 96% of the respondents preferred to sell their animals within markets in their region citing distances to other markets, security, volume of sales and unfamiliarity with distant markets as the major factors

influencing the decision, in that order. The study found out that over 75% of the pastoral households used visual assessment to peg prices to their animals before sale. This corroborates findings in Kaitho et al. (2004). As a follow-up step, pastoralists were asked to rank the attributes they considered when selling beef cattle. Table 1 summarizes these results by frequency.

The results from the transactional data, analyzed using regression analysis, are given in Table 2. Almost all the attributes were negatively correlated to the price, class, sex, volume, castration, grade and market. Other reported items, such castration and breed type were not significant. This could have been associated with the uniform/single breed available in each market. The analyses for the individual attributes indicate the relationships given below.

Class. The class of beef animal was used as a proxy for age (mature, young, immature), which showed that mature animals fetched higher prices than immature ones. The coefficient for class variable suggested that class had the largest negative influence on cattle price as indicated by the highest negative coefficient. Price decreased by 0.53% for a 1% change in class.

Sex. The results on the sex variable (male, female) showed that males fetched higher prices than females by a premium of 0.4% on average. This corroborates results of previous

studies by Sieff (1999) which showed that males usually fetched higher prices than females. The positive correlation coefficient observed for sex showed preference for males. Males are bought for both breeding and slaughter purposes. Their demand was expected to exceed that of female cattle, which are mainly required for breeding purposes. Males were also thought to yield more meat than females.

Market. The market variable has a negative coefficient (-0.149) and standard error of 0.012. The negative coefficient indicates that prices in Nairobi are higher than prices in other markets of Isiolo and Garissa. This is reasonable given that Nairobi is the terminal market.

Grade. The variable grade (grade 1, 2, 3, 4; the higher the grade, the poorer the body condition) is used to reflect the influence of the cattle body condition scoring method (a proxy for meat quality and weight) as developed by LINKS, and emerged as a significant explanatory variable. It has a negative coefficient (-0.147) with a standard error of 0.009. Animals available for sale in the markets were mainly grades 2 and 3. Grade 2 fetched a higher price than grade 3.

Volume. Volume was the other factor affecting prices. The volume had a standardized coefficient of -0.235. This corroborates well with the theory of standard demand which states that the lower the supply (volume) the higher the price. In this case it indicates that a 1% increase in volume decreased the average price by approximately 0.235%.

Breed. The breed variable (Boran, Zebu, Mixed) had a positive coefficient of 0.037 and standard error of 0.010. This indicated that mixed breeds (crosses) commanded higher prices than the local breeds such as Boran and Zebu.

Castration. Castration yielded a negative coefficient, –0.026 and standard error of 0.016. This implies that non-castrates fetched higher prices than castrates because they were in high demand both for breeding as well as slaughter purposes and were therefore regarded as premium animals. The results, however, were not significant at the 1% level.

The overall regression model explained about 82% of the total variation in the dependent variable. The regression model on factors influencing commercial offtake rates showed that market information had a positive response to livestock offtake rate; the response was significant at the 10% level with a coefficient of 0.074 and standard error of 0.007. Other significant variables determining offtake rate were household size, dependency ratio, cattle birth rate, cattle purchase rate, off-pastoral income and mortality rate. At the time of the study, market information provided by LINKS had just started diffusing to producers, and respondents felt that improved accuracy and reliability of market information would be useful for informing marketing decisions for pastoral households. Research findings (Aklilu et al. 2002; Mbogoh et al. 2005) show that information can indeed improve marketing performance in pastoral areas if it can be availed efficiently and in good time.

Practical Implications

The results indicate that livestock marketing information was not accessible to producers from September 2004 to September 2005, and hence did not play a significant role in influencing market prices. Subsequent analyses also show that producers consider a number of attributes when pegging prices to their animals, and that these tally with the categorization system developed by LINKS. LINKS has since responded to these factors through improvements in geographical coverage, accuracy, reliability and

Table 2. Regression results of the semi-log price model for beef cattle.

X	Variable	Unstandardized Coefficients		Standardized Coefficients	
		Beta	Std. Error	Beta	T value
	(Constant)+	10.17	0.07		151.04
1	Market+	-0.15	0.01	-0.19	-12.11
2	Class+	-0.53	0.01	-0.69	-42.23
3	Breed+	0.03	0.01	0.04	2.59
4	Volume+	0	0	-0.24	-14.39
5	Sex+	0.40	0.07	0.09	6.02
6	Castration	-0.03	0.02	-0.03	-1.69
7	Grade+	-0.15	0.01	-0.25	-16.86

Dependent Variable: Natural log of price
+ Significant at 1% level, R^2 = 0.821

timeliness in the overall livestock market information system. Therefore, the challenge to develop a flexible, demand-driven system that is easy to maintain and that allows the input of contents with maximum efficiency as envisaged by Kaitho et al. (2004) is right on course. The integration of this system in livestock markets across Kenya will provide a national livestock marketing information system (NLMIS: see Kariuki et al. 2008) tailored to meet the needs of livestock producers.

Dissemination of information through media that are easily accessible to most producers will enhance information flow to pastoral communities, eliciting the desired response in livestock marketing. It is therefore prudent to explore ways of using the existing delivery media, such as the popular radio broadcasts and the growing mobile telephony and Internet gateways across most towns in the remote areas of Kenya, to accomplish this feat.

Further Reading

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The GL-CRSP Livestock Information Network and Knowledge System (LINKS) project developed from the GL-CRSP Livestock Early Warning System (LEWS) project established in 1997. The LEWS project developed and applied a suite of information communication technology to provide a regional decision-support framework for livestock early warning. The LINKS project is placing LEWS technology inside a broader livestock information and analysis system that is designed to improve livestock markets and trade, thereby enhancing the well-being of pastoralists in eastern Africa. The project was led by Dr. Jerry W. Stuth, Texas A&M University until his death in April 2006. The project is now led by Dr. Paul Dyke, Texas A&M University. Email: dyke@brc.tamus.edu.