

## **Pastoralists Preferences for Cattle Traits: Letting Them be Heard**

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### **Introduction**

Pastoralists who inhabit the African arid and semi-arid lands (ASAL) are among the world's poorest populations. They lack vital infrastructure in the form of accessible roads, electricity and telecommunications, leaving them increasingly isolated. Livestock holdings of cattle, camels, goats and sheep often comprise the bulk of their limited wealth and are an integral part of their socio-cultural life. Herd size is often directly correlated to wealth and social status in the pastoral societies.

Along with the unfavorable agroecology of the ASAL and the limited livelihood opportunities, pastoral systems in Africa are exposed to frequent shocks ranging from recurrent droughts and banditry to livestock diseases. Such crisis often result in catastrophic herd losses, making the population increasingly vulnerable to food insecurity and forcing them to frequently rely on famine relief aid. Furthermore, where nomadic or transhumant grazing proved to be a viable coping strategy in the past, increasing population and evolving land rights patterns are reducing its effectiveness. With no mechanisms to insure themselves against the high downside risk they face, pastoralists undertake the costly and inefficient accumulation of stock during favorable periods to balance the high losses experienced during major droughts or disease outbreaks.

### **Sustainability of the Pastoralist Livelihood**

Despite the problems that beset the pastoral production system, it is an important source of meat for domestic consumption in sub-Saharan Africa. In Kenya, 70% of livestock is raised under pastoral systems and accounts for about 50% of local beef consumption. Demand for meat in the country has steadily increased since the 1980s and is still projected to rise. Much of the increase in demand since the 1980s has been met through unofficial cross border trade with Kenyan neighbors. This suggests that pastoral livestock production in Kenya can continue to be a viable livelihood option so long as the obstacles limiting its productivity and profitability are addressed.

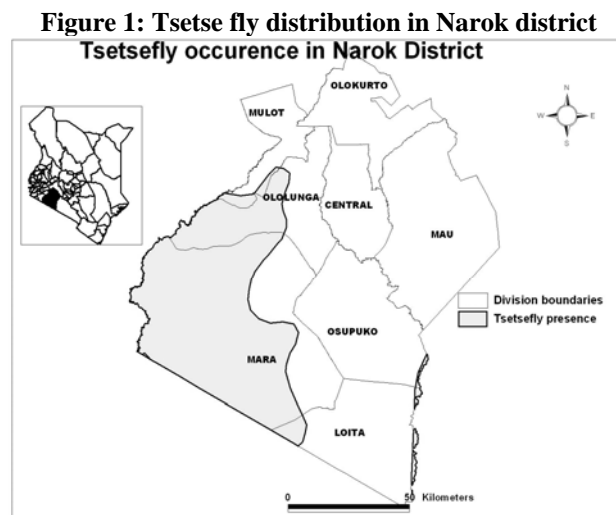
One key factor determining the expected profitability and associated risk of the pastoral production system is the hardiness of available livestock breeds to withstand the resource and disease pressures common in such environments while maintaining relatively high rates of productivity. In the face of frequently recurring droughts, lack of water and fodder for grazing is one of the leading causes of livestock mortality. Cyclical resource stress also reduces lactation rates, birthing frequency and leaves animals more susceptible to diseases. Diseases, especially those caused by parasites, are a further constraint to livestock productivity in pastoral areas, contributing to the high rates of mortality and low rates of productivity.

These particular set of productivity-limiting constraints suggest a pathway that could enhance the competitiveness of pastoral production systems. Breeding programs which

select for livestock traits that result in more robust, drought and disease resistant animals with relatively high lactation and fecundity rates would markedly improve the expected returns to livestock based pastoral livelihoods while reducing their vulnerability. By examining pastoralists' preferences for cattle traits, the paper summarized in this brief sheds light on pastoralists' own valuation of the livestock traits they consider particularly important. Such information can help assure that breed improvement interventions are consistent with the needs of the intended beneficiaries.

### Eliciting Preferences through Choice Experiments

In order to generate a relative ranking and valuation of the preferred cattle traits, the authors conducted choice experiments. By asking individuals to choose among several different cattle profiles, each of which includes the set of traits to be valued in various combinations, measures of the comparative utility each individual derives from the traits were estimated. The choice experiments were carried out in Mara and Ololunga divisions of Narok district in November 2004. Located in the south-west of Kenya bordering Tanzania to the south, Mara and Ololunga fall in lowland, semi-arid part of Narok, where trypanosomosis disease, mainly transmitted by tsetse flies pose a significant constraint to livestock productivity. Figure 1 presents the study sites and tsetse fly occurrence in the district.



Source: ILRI GIS Database

Both divisions are primarily habited by the Maasai people who practice nomadic pastoralism and small scale agriculture. The choice experiment was administered as part of a household level questionnaire to a random sample of 172 pastoral households spread among the two sample communities.

To identify the relevant cattle traits, given the agro-ecological environment and the specific livestock herding constraints faced in Mara and Ololunga divisions, a set of group discussions was held at each site. Based on the findings, the authors coded a total of eight preferred traits for cows and six for bulls. Each trait was the sub-divided into several levels which offered different endowment levels for the trait. Table 1 presents the traits included in the choice experiment and their levels.

**Table 1: Traits and Trait Levels used in Choice Experiments**

| <b>Cow Traits</b>              | <b>Levels</b>  | <b>Bull Traits</b>             | <b>Levels</b>  |
|--------------------------------|--|--------------------------------|--|
| <b>Typanotolerance</b>         | 1. Tolerant<br>2. Susceptible                        | <b>Typanotolerance</b>         | 1. Tolerant<br>2. Susceptible                        |
| <b>Milk Yield</b>              | 1. 1-2 litres/day<br>2. 2-4 litres/day               | <b>Fertility</b>               | 1. High<br>2. Low                                    |
| <b>Reproduction potential</b>  | 1. 1 calf every year<br>2. 1 calf in two years       | <b>Coat Color</b>              | 1. Light-colored<br>2. Dark-colored                  |
| <b>Coat Color</b>              | 1. Light-colored<br>2. Dark-colored                  | <b>Purchase price in 4 yrs</b> | 1. Ksh 11,000<br>2. Ksh 20,000<br>3. Ksh 27,000      |
| <b>Purchase price at 2 yrs</b> | 1. Ksh 10,000<br>2. Ksh, 15,000<br>3. Ksh 19,500     | <b>Watering Frequency</b>      | 1. Once in 2 days<br>2. Once a day<br>3. Twice a day |
| <b>Watering frequency</b>      | 1. Once in 2 days<br>2. Once a day<br>3. Twice a day | <b>Live weight at 4 yrs</b>    | 1. 200 kg<br>2. 320 kg<br>3. 450 kg                  |
| <b>Live weight at 2 years</b>  | 1. 120 kg<br>2. 190 kg<br>3. 250 kg                  |                                |  |
| <b>Feeding Requirements</b>    | 1. Need supplements<br>2. No need for supplements    |                                |  |

These traits were then combined to create various profiles of cows and bulls, each of which included a unique level of each trait. Respondents were then offered several pairs of profiles and asked to choose the one they preferred. Their choices revealed their preferences.

### **Preferred Cattle Traits**

Results show preference for cows that are typano-tolerant, have high live weight, high milk yields and high reproduction ability. Many of these preferred traits are interdependent. A trypanosomosis infected cow, for instance, is also likely to have low lactation rates, low weight and be less fertile. The high preference for typanotolerance is consistent with the costly toll trypanosomosis exacts on pastoralists. Indeed, trypanosomosis is of the most important diseases afflicting pastoralist's herds, limiting livestock productivity due to poor growth, weight loss, low milk yield, infertility and abortion. Total annual expenditures on curative and preventive treatments for trypanosomosis in sub-Saharan Africa by livestock keepers and governments, has been estimated at about US\$ 35 million, administering 25–35 million curative and prophylactic treatments of trypanocidal drugs at a price of approximately US\$ 1 per treatment. It has been estimated that control of trypanosomosis would result in substantial increases of milk and meat supply of sub – Saharan Africa by a substantial 17%.

The key traits preferred in bulls, with the obvious exception of milk yield, are similar. As one would expect given the regular feed and water constraints, traits associated with drought tolerance are also considered important. Willingness to pay estimates indicate that a typano-tolerant cow or bull is valued at \$11 more than a typano-susceptible one. This compares with the estimated \$8.70 annual treatment cost for trypanosomosis per

animal. Live-weight increases, which is associated with meat production, is valued at \$1.15 per kg. This is comparable with the value of 1kg of slaughter weight of approximately \$1.07.

### **Conclusion and Policy Implications**

The revealed preference for certain cattle traits provides breed improvement programs with important information on the key constraints that pastoralists face. Trypanosomosis disease, which takes a particularly high toll on pastoralists' livestock, and whose impact has serious implications on livestock productivity through weight loss, low milk yield and infertility seems to be of particular concern. Genetically controlled tolerance of the disease by way of systematic breeding of trypano-tolerant breeds offers a potentially effective route for improving livestock productivity. While the positive externalities of trypano-tolerance suggests that average milk yields, live weight, and reproduction rates may improve, breed improvement programs should also integrate other favorable environmental adaptive traits such as drought tolerance into the animals they breed. The possible trade-off between highly productive animals and robust, disease and drought tolerant animals should take into account the environments the breeds will be faced with.

For the benefits of breeding to have an effective impact on livestock productivity for the intended recipients, a participatory approach that solicits the opinion of pastoralists and disseminates the expected benefits of new breeds is important. The design of breeding schemes needs to consider the socioeconomic parameters that may determine the effectiveness of particular programs. For example, while group breeding schemes have been identified in economic literature as potential pathways to achieve measurable genetic gains of livestock traits in zero-grazing systems, pastoralists report an unwillingness to participate in communal breeding schemes due to likelihood of conflict arising from group member differences and management issues.

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