Characterisation of the livestock production system and potential for enhancing productivity through improved feeding in Bbaale, Uganda, March 2010

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The Feed Assessment Tool (FEAST) is a systematic method to assess local feed resource availability and use. It helps in the design of intervention strategies aiming to optimize feed utilization and animal production. More information and the manual can be obtained at www.ilri.org/feast

FEAST is a tool in constant development and improvement. Feedback is welcome and should be directed to feast@cgiar.org. The International Livestock Research Institute (ILRI) is not responsible for the quality and validity of results obtained using the FEAST methodology.

The Feed Assessment Tool (FEAST) was used to characterize the livestock production system and in particular feed-related aspects in Bbaale dairy farmers association (DFBA) of Bbaale country, Kayunga district, Uganda. The assessment was carried out through structured group discussions and completion of short questionnaires by key farmers’ representatives on 22nd of March 2010¹. The following are the findings of the assessment and conclusions for further action.

**Farming system**

Bbaale County is located in the extreme northern Kayunga district. The travel distance by road is approximately 145 kilometres from the capital city of Uganda, Kampala. Households in this area are composed of approximately 8 (range 6-11) members and utilise on average 75 acres of pastoral land. Table 1 shows farmers perceptions about average land sizes for different categories of farmers.

<table>
<thead>
<tr>
<th>Category of farmer</th>
<th>Range of land size (acres)</th>
<th>% of households that fall into the category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landless</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Small farmer</td>
<td>50</td>
<td>35</td>
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<tr>
<td>Medium farmer</td>
<td>75</td>
<td>45</td>
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<tr>
<td>Large farmer</td>
<td>200</td>
<td>20</td>
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</tbody>
</table>

**Figure 1: Average land sizes owned by different categories of farmers in Bbale, Kayunga, Uganda.**

The production system is primarily pastoralist focused on livestock keeping with very few farmers growing food, mainly maize (*Zea mays*), cassava (*Manihot esculenta*), potato (*Solanum tuberosum*), and bananas. Other varieties of leguminous beans are also grown by some farmers in varying

¹ The very small number of respondents for questionnaires means that the figures in this report are only indicative and should not be considered an accurate reflection of quantitative aspects of the farming system. However, they are adequate to give a crude overall impression for the purposes of guiding thinking about constraints and interventions.
quantities as seen in Figure 2. All crops are grown during the wet season; however, rainfall patterns are becoming unpredictable and unreliable (Table 2). Crops are grown for income and as a source of household food.

Table 2: Cropping season that occur in the area

<table>
<thead>
<tr>
<th>Name of season</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>April</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
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<tbody>
<tr>
<td>Long wet (Togo)</td>
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<td>Short wet (Dumbi)</td>
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<tr>
<td>Dry (Musambja)</td>
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</tbody>
</table>

Milk production is an important means of regular income generation with many farmers possessing Nganda, Ankole and Karamoja types of indigenous cattle. These are also sold for meat to provide substantial income when the need arises and to pay dowries. A few farmers keep improved crossbred animals for increased milk production. Sheep and goats are also kept by some farmers for sale when funds are needed quickly. Shoats are also kept for meat and cultural uses. Pigs and indigenous chickens are also kept by some farmers. Due to the large size of land holdings and herds, labour is generally required to herd cattle especially in the dry season when herds migrate to look for pasture. However management during migration has become easier since most herdsmen are provided with mobile phones. Herding labour costs between 40,000 – 50,000 UGS (17-21 US$) per month in addition to provision of food and 3-5 litres of milk daily. Manual labour to open an acre of land is more costly at 70,000-80,000 UGS (29-33 US$). Factoring in daily provisions overall labour costs become very costly.

![Crops grown in the area](image)

**Figure 2:** Crop varieties grown in Bbale, Kayunga, Uganda.

**Major income sources**

The main contributors to income are business (50%) and cereal crops, mainly maize (30%) (Figure 3). Maize is important because households sell the grain as well stover for livestock feed. Milk and livestock sales contribute approximately 13% to household income. Other products such as eggs
contribute negligible amounts (7%) to income. However, this may change in the future as dairying becomes more lucrative due to the increased milk yields that can be achieved with the further introduction of improved breeds.

**Livestock production system**

Cattle are the most important livestock species in this system as they provide milk, meat and cash income to the households (Figure 4). Local indigenous breed are overwhelmingly the most important in this area kept by approximately 86% of all households. However, the area appears to be experiencing a transitional period with many farmers attempting to improve milk production per cow as their lands continue to be encroached upon by bush making grazing difficult. At present, approximately 21% of the farmers keep improved cattle. Draught animals kept by approximately 11% of the farmers are also important. All cows (predominately indigenous breeds) are milked regularly during lactation. The average milk production per cow per day is 2.5 litres. The resultant milk is then sold to Bbale Dairy Farmer Association (DFBA) and also sold in the local market centres for an average of 338 UGS (0.14 US$) per litre throughout the year (range 300-500 UGS/litre (0.13-0.21 US$)).
Figure 4: Average livestock holdings per household in Tropical Livestock Units (TLU)

Management of livestock species

Management practices of the cattle are broadly similar between households in the area. However, they differ based on the season and quality of the animal. Crossbred and improved cows are kept and managed separately. Both classes of cattle are grazed throughout the day and confined in cattle sheds overnight. However, improved cattle are often grazed on improved pastures while local cattle are allowed to search for pasture in the thickets of trees and shrubs. Improved cattle may be supplemented with additional forage or supplements overnight. Cattle tend to move longer distances during the dry season than the wet season. Pigs are tethered within the close proximity of the homestead.

Private and government veterinarians are the most important animal health providers available to farmers in the area. Most farmers tend to prefer government veterinarians because the technical capabilities of private veterinarians are uncertain. However, services of both types of health providers are costly to most farmers. For example, treating East Coast Fever (ECF) costs farmers 25,000–50,000 per dose while they pay 9,000–15,000 per dose for lumpy skin disease. Vaccines for Caprine Bovine Pleural Pneumonia (CBPP) and Foot and Mouth Diseases cost UGS 6000 and 5000 (2–3 US$) respectively.

Artificial Insemination (A.I.) is available at the Bbale DFBA and also through government and private practitioners. However, farmers have to request and pay for services including transport charges. A.I. charges are variable depending on distance and type of practitioner. Bbale DFBA charges UGS 27,000 (11 US$) per service per cow and the same again for repeat services. This includes UGS 7,500, 2,500, and 3,000 for straw, liquid nitrogen and disposable items cost respectively plus UGS 10,000 and 5,000 for labour and transport charges respectively. Most farmers use their own local bull service. However, those who do not have bulls pay USH 5,000 (2 US$) per service.

At present cattle prices vary with season increasing during the wet season (700,000 – 800,000 UGS (292–333 US$) per head) and dropping drastically in the dry season (250,000 – 300,000 UGS (104–125 US$) per head) during the dry season. Sheep and goat prices tend to remain the same throughout the year ranging 50,000 – 60,000 UGS (21–25 US$) per head.
Major feed sources through the year

Grazing contributes the largest proportion of the feed base on a dry matter (DM) basis in the area (Figure 5a) and consequently metabolisable energy (ME) and crude protein (CP), (Figure 5b and c) Purchased feed and naturally occurring feeds are also important. Maize stover is overwhelmingly the most import purchased feed resource in the area (Figure 5d).

**Figure 5: Contribution to dietary requirements in the study area; A- Dry Matter (DM); B- Metabolisable Energy (ME); C – Crude Protein (CP) and D - Quantities of feed purchased over the last 12 months.**

Grazing is the primary component of the feed base within this area throughout most of the year. However, grazing drastically reduces during the dry season in January – February when crop residues are plentiful compared to grazing as shown in Figure 6. However, after April the quantity of residues are proportionally smaller than grazing but are still present for most of the year. Farmers also purchase small amounts of concentrate feeds throughout the year. Concentrate contains predominately wheat bran. Concentrate feeding tends to be targeted toward improved breeds with higher amounts available during the wet than dry season.
Problems, issues and opportunities
The main issues faced by farmers are lack of water especially during the dry season and the bush encroachment problem on grazing pastures. The expansive pastoral system does not have adequate water dams and these are located long distances from most households. Poor use and drainage has compromised water quality (Photo 1). This system relies heavily on grazing and collected feedstuffs such as agro by products as a source of feed. With migration as a result of severe drought within the area, the quantity of collected feeds available each year is decreasing as cropping decreases. The encroachment of bush on grazing pasture has drastically reduced biomass production from grazing lands and this has led to overgrazing. This is aggravated by presence of termites on grazing lands reducing grazing areas even further. Some farmers have already commenced purchasing concentrate feed to help alleviate this constraint. There is an emerging trend in purchasing forage especially crop residues. However, there is no attempt by some farmers to improve the quality of the crop residues. A lack of improved dairy breeds is also a clear constraint to the further development of milk production within the area. Artificial Insemination (AI) services will help disseminate improved genetics; however, the service is not reliable within the area and is costly to farmers. Other animal health related issues include the prevalence of tsetse fly and tick borne disease.
Photo 1: A poorly drained water dam heavily infected with algae in Bbale, Kayunga, Uganda

Potential interventions
The combination of shrinking grazing lands and reduced availability of collected feeds as well as lack of cereal crop residues put the farmers in this area in a difficult position in terms of increasing their productive output as there are very few on-farm options available to them. To alleviate feed constraints it will be necessary for farmers to produce more feed biomass per hectare from grazing. Improved biomass production from grazing can be facilitated through the use of simple pasture improvement technologies such as bush clearing and using over sowing strategies e.g. strip and band sowing. Farmers also have the option to purchase larger quantities of concentrate. This will significantly increase the cost of production. Enhancing pasture quality through collective action is a promising option. However, increased milk production will also be required to offset the increased cost of production. Therefore, it will be imperative that an integrated approach is taken and efforts are also made to upgrade existing cattle breeds through improved access to AI services.

Key issues
- Lack of water especially during the dry season
- Bush problem leading to decreased grazing pastures
- Lack of feed sources, both in terms of quantity and quality
- Poor milk yields
- Lack of access to AI services and improved dairy cattle breeds

Ways forward
- Introduce strategies to improve pasture through collective action
- Enhance arrangements for purchase of fodder from urban fodder producers
- Improve AI services

Conclusion
This area is predominately a pastoral livestock production system. At present, milk and livestock sales are the primary agricultural contributors to household income. Cattle are the most important livestock species. The area is currently experiencing feed shortages and farmers are looking into other options such as purchasing feed. Improved milk production is constrained by a lack of feed sources (both in terms of quality and quantity) and access to improved dairy breeds. To mitigate these constraints farmers (and other stakeholders) will be required to take an integrated approach
to improve feed production through pasture improvement strategies, importing feed and improving access to AI facilities to ensure farmers can rapidly upgrade the genetic merit of their cattle holdings.